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LITHOGRAPHIC ABSTRACTS 1954

Monthly Lithographic Abstracts
September, 1953 through July, 1954

LITHOGRAPHIC TECHNICAL FOUNDATION, INC.

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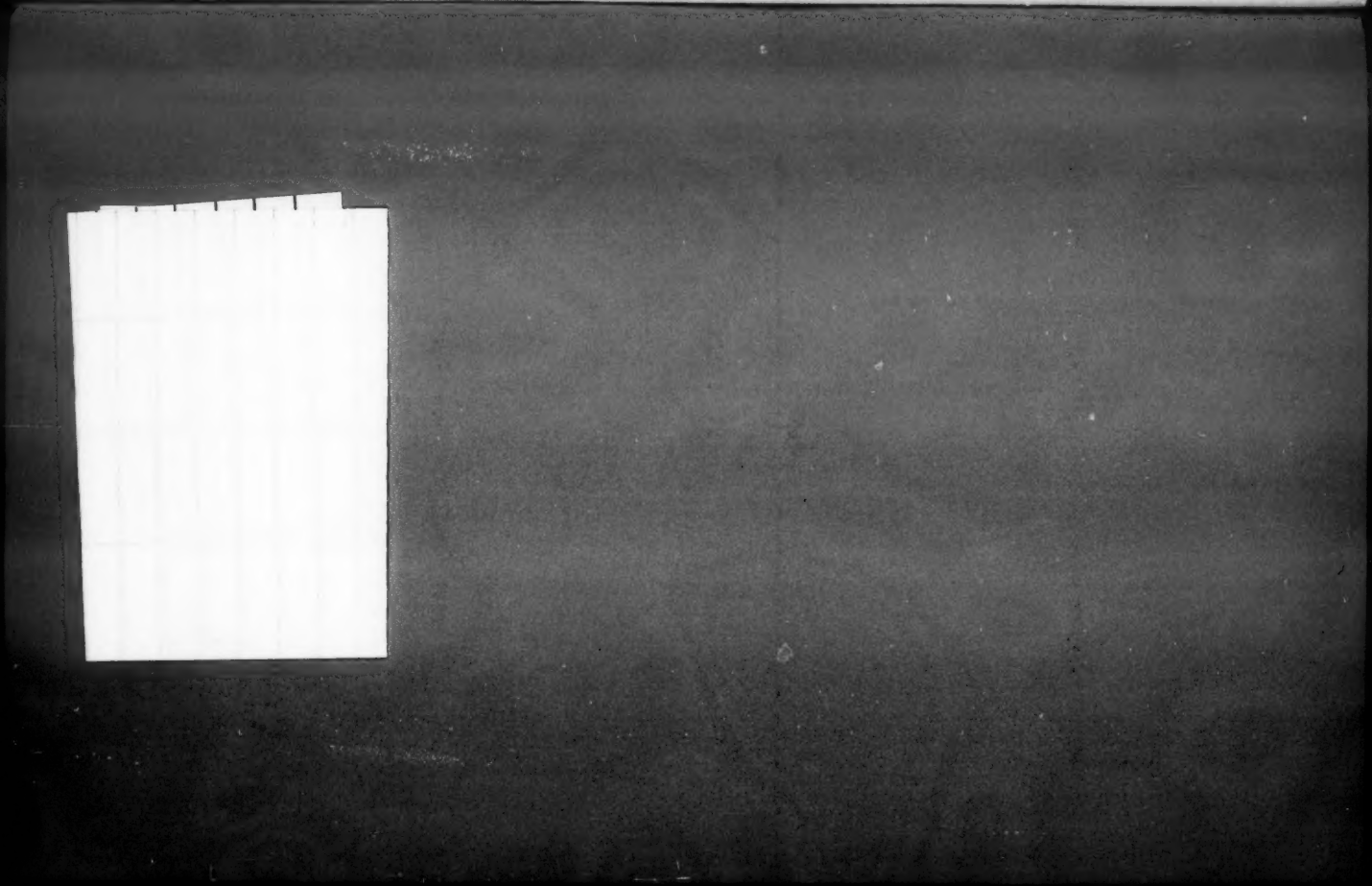

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LITHOGRAPHIC TECHNICAL FOUNDATION, INC.
131 East 39th Street, New York 16, N. Y.

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LITHOGRAPHIC ABSTRACTS are published monthly in the trade press. Because of the exigencies of magazine publication, a complete set of abstracts cannot be had from one source. For this reason, and for the convenience of the lithographic industry, annual publication commenced with the 1947 issue. The months *September, 1953* through *July, 1954* are included in this issue. Plans are underway to publish Lithographic Abstracts prior to 1947.

Abstracts of important current articles, patents, and books are compiled by the Research Department of the Lithographic Technical Foundation, Inc. These abstracts represent statements made by the authors of articles abstracted and do not express the opinions of the abstractors or of the Research Department. Mimeographed lists have been prepared of (1) *Periodicals abstracted by the Department of Lithographic Research*, and (2) *Books of interest to lithographers*. Either list may be obtained for ten cents in coin or U.S. stamps. Address the Lithographic Technical Foundation, Inc., Research Dept., Glessner House, 1800 S. Prairie Ave., Chicago 16, Ill.

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PHOTOGRAPHIC EQUIPMENT AND METHODS

A NEW APPROACH TO THE EVALUATION OF THE PERFORMANCE OF PHOTOGRAPHIC LENSES. Frank G. Back. *Journal of the Optical Society of America* 43, No. 8, August, 1953, pages 685-689 (5 pages). Lens performance evaluation in terms of resolving power has proven unsatisfactory. The concept of definition has therefore been introduced combining contrast with resolving power. A new method of lens evaluation will be described which takes all factors of image definition into consideration and relates them to the speed of the lens.

MATERIALS OF CONSTRUCTION FOR PHOTOGRAPHIC PROCESSING EQUIPMENT. L. E. Muehler and J. I. Crabtree. *Photographic Society of America Journal* 19b, August, 1953, pages 92-104 (13 pages). Various types of non-metal materials from the wide field available are discussed in relation to certain properties and uses in photographic processing equipment. The substances range from natural materials such as quarried silicate rock (Alberene stone) and wood to a host of synthetic products, including ceramic and glass compositions, rubber and synthetic elastomer materials, plastics, and organic coatings and linings. Relatively thin organic coatings are not recommended for continuous service. The fact that modified wood products, such as paraffined wood and thermosetting phenolic resin-bonded plywood, are waterproof makes them useful in certain cases. The desirability is stressed of selecting a material and knowing its general characteristics prior to the detailed designing of processing equipment. Materials can be selected from the summary tables or determined by separate chemical resistivity and photographic inertness tests as previously described. Approved methods of fabricating tanks of stainless steel are described, the metallic arc method being preferred, using water-cooling applied to the back as the welding proceeds except with stabilized or extra low carbon varieties. Some peculiarities and cautions in regard to stainless steels, their properties, use, and care are emphasized. Methods of spot-testing metals and alloys for identification are discussed, and a rapid method of differentiating Type 316 and other molybdenum-containing stainless steels from the non-molybdenum varieties is given.

COLD CATHODE LIGHT SOURCE POTENTIALS IN PHOTOGRAPHY David B. Eisendrath, Jr. *Photographic Society of America Journal* 19b, August, 1953, pages 125-127 (3 pages). The characteristics of cold-cathode light sources make them particularly applicable for photographic use. Factors which contribute to the increasing popularity of this illuminant are: accurate shaping of small diameter tubing to any design and length: control of color emission by variations of glass, gas, phosphor and selective filtering: constancy and evenness of illumination with continuous or intermittent use: and long life with minimum heat.

THE DIAPHRAGM SLIDE RULE. Henry R. Long. *National Lithographer* 60, No. 8, August, 1953, pages 34-37 (4 pages). The construction and use of a slide rule for process lens diaphragm is discussed. It is to be used on older type cameras not having built-in lens diaphragm controls. A screen separation chart and slide rule are included.

UNIVERSAL, HIGH-SENSITIVITY PHOTOMETER FOR MEASURING LIGHT SCATTERING, LUMINESCENCE, TRANSMITTANCE AND REFLECTANCE. Gerald Oster. *Analytical Chemistry* 25, No. 8, August, 1953, pages 1165-9 (5 pages). A high-sensitivity photometer with readily interchangeable optical components was needed in order to carry out a wide variety of accurate photometric measurements on a single instrument. A photometer has been developed employing a photomultiplier tube whose output is amplified by means of an electrometer tube. The instrument is capable of measuring light intensities

down to 29 microlamberts. Colored filters, neutral filters, and polarizer may be inserted in various combinations for both the incident and observed beams. The receiver phototube may be rotated about any angle with respect to the incident beam. Cells for liquid samples (including micro quantities) and flat samples have been constructed. The performance of the instrument is illustrated by 12 distinct types of measurements, which include quantitative measurements of light scattering (turbidity, particle counting, and dissymmetry), luminescence (fluorescence, phosphorescence, and chemiluminescence), transmittance of high absorbance systems, and reflectance goniometry. The instrument is well suited for the measurement of transmittance and reflectance of paper. The results of angular reflection of green light (546 mμ) by a white bond paper are shown graphically. 8 figures and 19 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 1, September, 1953, pages 42-3.

* PHOTO MECHANICAL PRINTING PLATES. *British Patent 656,235.* Interchemical Corporation. *Abridgement of Specifications* XX, 1953, page 345. The continuous variation of tone of an original representation is reproduced by photo-electric scanning and reproducing apparatus in the form of a recorded photographic image, or a printing plate made therefrom, by means of spaced rectangular dots of black and white on light and dark backgrounds respectively, in which both dimensions of the dots and the spacing between the centres of the dots are varied with the tone of the original. The image plates may be used in typographical or lithographic processes, and in the case of an intaglio process white dividing lines of small width are formed in the dark areas to produce narrow ridges in the intaglio plate.

* DIRECT PHOTOGRAPHY OF PRINTING FORMS. *U. S. Patent 2,624,700.* G. L. Morrison. *Monthly Abstract Bulletin* 39, No. 8, August, 1953, page 396. To avoid having to print a proof sheet to be used in photographic reproduction, a printing form of type metal and at least one other metal is prepared. It can be photographed directly by electroplating the whole surface with a metal of similar color to type metal, applying a light-absorbing coating to the surface, removing the coating from the relief surfaces while leaving it intact on the other surfaces of the form, and abrading the relief surfaces to produce diffuse reflection.

* PHOTOGRAPHIC METHOD FOR PRODUCING BOUNDARY LINES. *U.S. Patent 2,618,554.* E. Zeiger and L. Frank. *Monthly Abstract Bulletin* 39, No. 8, August, 1953, pages 392-3. A design is reproduced photographically by placing it over a light-sensitive layer, with a layer of transparent material interposed, and an exposure is made to diffuse light which cuts behind the edges of the design. The sensitive surface is then developed and dried but not fixed, a further exposure is made to a beam of light through a screen but without the design on it, and the sensitive surface is then developed, fixed, and subjected to a reducing process which clears the incompletely exposed areas where the diffuse light has cut behind the edges of the design. In this way, boundary lines are obtained around the objects constituting the design.

* PHOTOGRAPHIC STEP-and-REPEAT COPYING APPARATUS. *British Patent 663,175.* A. R. Kilminster. *Abridgment of Specifications* XX, 1954, pages 52-3. The apparatus includes a control device for moving a carrier unit automatically to successive predetermined positions, comprising an electric motor to effect traversing of the carrier unit, operation of the motor being effected by a control drum rotatable synchronously therewith and having an electrically conductive peripheral surface, in association with an electrical control unit electrically connected to an electrical

contact movable in timed relation with the drum in a path parallel with the axis thereof, the control drum being adapted to have secured round its periphery a strip of insulating material in which apertures are formed in predetermined spaced relation for determining the intervals at which contact is effected between the contact and the peripheral surface of the drum.

* LENTICULAR DEVICE FOR PRODUCING PHOTOGRAPHS SHOWING RELIEF AND MOVEMENT. *Brit. Patent 653,393.* M. Bonnet. *Photographic Abstracts* 34, Part 1, 1954, page 57. A camera is described which employs a lenticular screen in contact with the negative. During exposure the frame containing the screen and negative is rotated through a small angle about a horizontal axis at right angles to the optical axis of the lens. When the print is viewed in conjunction with another suitable lenticular screen, not only does the picture appear in relief, but an impression of movement is obtained when the viewer's head moves either in a vertical direction or in a direction perpendicular to the picture. Some details of the printing method are given and reference is made to two other relevant patents: *British Patent 622,919* and *British Patent 639,406.*

LTF'S NEW LAMP FOR CONTACT PRINTING. George W. Jorgensen. *Lithographers Journal* 39, No. 1, April, 1954, pages 24-5 and 64 (3 pages). The new LTF contact printing lamp is described in detail. Contact printing lamps are perhaps the most non-standard piece of equipment in the lithographic plant. Requirements for a good lamp, construction of the lamp, comparison of the lamp with others, design and the lamp's availability are all discussed in this complete article.

CURRENT THOUGHTS ON REPRODUCTION. J. S. Mertle. *Modern Lithographer and Offset Printer* 50, No. 3, March, 1954, pages 26 and 28 (2 pages). A brief description of W. E. Huebner's Color Cancellator, used in color separation work, is given. Also a review of screen plate color photography is made with suggestions. In conclusion, mention is made of quality in halftone procedures in relation to the final printed results.

NEW PICTURES FOR OLD. *American Newspaper Publishers Association* Bulletin No. 89, July 7, 1954, pages 37-38 (2 pages). The National Bureau of Standards has developed an electronic scanning device which can clarify blurred photos or convert photographs to line drawings. The process is described as an "optico-electronic system that will facilitate the study of visual perception and recognition of patterns." The device operates on the same basic principle as a television set. A cathode-ray scanning oscilloscope is focused on a transparency of the picture to be clarified. A photo-electric tube is placed on the other side of the transparency. The scanning oscilloscope generates a beam of electrons which gyrate rapidly in a series of curved patterns, covering the phosphor-coated face of the oscilloscope. The collision of electrons with the phosphor coating causes a glow on the face of the oscilloscope tube which, because of the speed of the gyrations, gives the illusion of continuous glow to the eye. This glow pattern is focused optically to cover the picture transparency.

TRANSPARENT CELLULOSE PROOFS. William W. Mason. *Share Your Knowledge Review* 35, No. 9, June, 1954, pages 19-21 (3 pages). This article describes transparent cellulose proofs, what they are and what they are used for. Transparent impressions are: 1. For making contact prints on zinc lithograph plates for deep-etch process; 2. For contact printing on zinc plates to make reverses by the albumen process; 3. For contact printing in gravure; 4. For converting halftone letterpress color process plates to lithograph plates; 5. For contact printing on copper or zinc to make reverse letterpress plates; and 6. For contact printing on sensitized film or glass to make a negative. The negative, in turn, is used for contact

printing on zinc plates for lithographing by albumen process, or for contact printing on copper or zinc to make duplicate letterpress plates of type, line cuts or halftones.

PRACTICAL SENSITOMETRY: THE H AND D CURVE. Stanley Goldstmith. *Modern Lithography* 21, *11*, November, 1953, pp. 71, 73, 75, and 77 (4 pages). The H and D curve or the D-log E curve is described and the useful information that can be obtained from it is listed. Short detailed information concerning Gamma, Curve slope, Toe, Emulsion, Developer, Flare and Fog, Straight Line Portion, Shoulder, and Density Range is given. A Gamma Meter is also described.

PROCESSING

THE RECOVERY OF SILVER FROM WASTE HYPO SOLUTIONS. Henry A. Beechem. *Graphic Arts Monthly* 25, No. 8, August, 1953, pages 98, 100 & 102 (3 pages). A discussion of some of the important methods for the recovery of silver from waste photographic baths and the conditions under which such recovery is worthwhile.

PHOTOTHERMOGRAPHY. P. A. van der Meulen and Robert C. Countryman. *Photographic Engineering* 4, No. 2, 1953, pages 104-112 (9 pages). A new non-silver-halide imaging system is presented. Experimental work involving the preparation and testing of emulsions containing mercurous oxalate is described. It is shown that the important factors producing sensitive emulsions are: absence of certain inhibiting impurities, precipitation of the mercurous oxalate in the presence of excess oxalate, addition of potassium oxalate to the washed emulsion. The emulsion is especially sensitive in the ultraviolet, but the addition of certain dyes produces sensitization to parts of the visible spectrum.

• IMPROVEMENTS IN OR RELATING TO LITHOGRAPHIC DEVELOPERS. *British Patent 643,441*. E. I. du Pont de Nemours and Company, Inc. *Monthly Abstract Bulletin* 39, No. 2, February, 1953, page 56. A concentrated liquid photographic developer has two components: (A) a water solution of sodium formaldehyde bisulfite, hydroquinone, and a solvent, e.g., ethyl alcohol; and (B) a water solution of a weak acid, e.g., boric acid, an alkali-metal bromide, and a salt of alkalinity sufficient to give the final developer a pH of at least 9.9.

WET PLATE VS. INFECTIOUSLY DEVELOPED SILVER GELATINE EMULSION. *Modern Lithographer and Offset Printer* 49, No. 10, October, 1953, pages 24-27 (4 pages). It is generally agreed that the ideal line or halftone material for use in preparing reproduction printing plates must render the maximum contrast and sharpness of image. Several factors must be taken into account when considering the type of photographic material required to give this result and the chief ones are the contrast of the sensitive material, the thickness and light scattering properties of the layer, the limitation of halation, and the influence of adjacency effects during processing.

TWO-BATH FIXATION OF PRINTS. J. I. Crabtree, R. W. Henn and R. F. Edgerton. *Photographic Society of America* 19b, No. 1, February, 1953, pages 10-16 (7 pages). When using two successive fixing baths, solubilization of the silver halide is accomplished in the first bath, while the second, relatively fresh bath, is used to wash out the complex silver thiosulfates formed in the first bath. It is these salts which decompose to form over-all stain on prints which contain residual silver; hence the useful life of a print fixing bath is largely determined by the silver content. The accumulation of silver in the second bath is dependent upon (a) the silver content of the emulsion, (b) the amount of image developed, and (c) the rate of carry-over from the first bath. It is customary to advance the relatively slightly used second bath at the end of each cycle to replace the first.

This introduces more silver into the system on succeeding cycles, but equilibrium is soon reached with approximately a one-third increase in the silver content of the second bath. The economy of two-bath fixation is considerable, it being possible to process 200 prints per gallon as against 50 in a single bath with the same final degree of print permanence.

* LIGHT SENSITIVE SILVER HALIDE EMULSIONS FOR USE IN HALFTONE PHOTOGRAPHIC PROCESSES. *British Patent 694,848.* R. E. Maurer. *J. appl. Chem.* 4, Part I, January, 1954, Column 47; *Printing Abstracts* 9, No. 4, April, 1954, page 289. The Albert reversal is employed to provide a difference in sensitivity between the centres and the corners of the elements of a prescreened photographic film. A silver halide emulsion layer having a max. γ greater than 4 is exposed through a halftone screen for a time between threshold Albert and optimum Albert exposure for all points of the dot pattern. The exposed layer is immersed in a bleach bath which does not dissolve the silver halide, so that the layer receives a halftone pattern of Albert reversal dot areas with a sensitivity at the corners, i.e., at the maximum reversed points, equal to less than 1/5 the sensitivity at the centres of the dots, with a max. γ at the corners greater than 2. After the latent bleach, the film may be employed for the making of halftones by exposing it to a continuous tone image and then developing it in the standard developer used with high-contrast films.

HALFTONE PHOTOGRAPHY

* PRODUCING HALFTONE PHOTOGRAPHS. *British Patent 653,564.* N. W. Yelland. *Abridgment of Specifications* XX, 1953, page 287. Continuous-tone images are converted into half-tone photographic images which require less retouching by using a half-tone screen with positive refracting elements and controlling the distribution of the light in the dots which expose the photographic recording surface by using as a source of light an illuminated surface which is masked as by means of suitably shaped diaphragms or screens of radially diminishing transmission. As shown, a lamp *s* illuminates an opal glass disc *r* situated at the focus of a lens *t* so that parallel light passes perpendicularly through a screen *c* having refracting elements and a cover-plate *i*, and a continuous-tone negative *k* to expose a photographic plate *j*. The distribution of illumination in the dots is controlled by a chosen diaphragm of the kind shown in Fig. 5 carried by the disc *r* which is rapidly rotated by a motor-driven belt and pulley system.

THE EFFECT OF MULTIPLE INTERNAL REFLECTIONS ON THE DENSITIES OF HALFTONE PRINTS ON PAPER. F. R. Clapper and J. A. C. Yule. *Journal of the Optical Society of America* 43, No 7, July, 1953, pages 600-603 (4 pages). The equation relating dot area to halftone density, when sideways scattering of light takes place in the paper, has been modified to take into account multiple internal reflections. Curves showing the relationship between dot area and density for various ink densities and amounts of first-surface reflectance are given. Callahan's conclusion that these effects are negligible is not in accordance with the author's experience, and the new equations indicate the possibility of densities much higher than the limiting values derived from Callahan's equations and from our earlier equation which neglected multiple internal reflectance.

* PHOTO MECHANICAL PRINTING PROCESS. *British Patent 648,886.* Printing Arts Research Laboratories, Inc. *Abridgement of Specifications* XX, 1953, page 171. In producing a halftone negative from a line drawing having opaque portions such as lines or lettering and "shaded" portions of graded opacity the

latter are formed by a substance opaque to ultraviolet light and the negative is taken by means of ultraviolet and visible actinic light through a halftone screen having a system of lines opaque to visible actinic light but transparent to ultraviolet light. By this means only the "shaded" portions of the negative have a screen pattern. If desired the negative may be "flashed" when covered by a suitable drawing to produce a slight screen pattern in all but the high lights and the line portions. The exposures with visible actinic light and with ultraviolet light may be made simultaneously or consecutively. As shown, the screen may comprise two glass plates having grooves 12 filled with a transparent substance such as polymerized methyl methacrylate dyed with fuchsine, nitroso-dimethyl-aniline, or methyl orange, or be glass or gelatine suspensions of nickel and cobalt salts, cobalt chloride and copper sulphate. Alternatively the screen may be formed photographically, the exposed silver being converted to a dye and the unexposed portions of the gelatine emulsion being removed. For producing the "shaded" portions of the original drawings there is used as a medium for the pigment a mixture of quinine sulphate, sulphuric acid and egg albumin.

HALFTONE THEORY DEBATE CONCLUDED. Dr. V. G. Harrison replies to W. B. Hislop. *Process Engravers Monthly* 60, No. 711, March, 1953, pages 78 and 83 (2 pages). Dr. Harrison's reply to W. B. Hislop in a continuation of their discussion of the halftone process points out that the dot patterns made by an aperture with and without a lens are physically distinct. However, that they are frequently very similar he considers to be more or less fortuitous.

HALFTONE POSITIVES FOR DEEP-ETCH. F. Kaiser. *Process Engravers Monthly* 60, No. 716, August, 1953, pages 232-4 (3 pages). Introduction of densitometric control for the determination of exposure of halftone positives which eliminates needless retakes, excessive handwork, and guesswork in exposure. A standard set of gray scales is used by both cameramen and art department men such that all work for the same end result. The method took about one year to develop under plant conditions but has proven successful and a similar procedure is being worked out for magenta-screen positives.

* PHOTOGRAPHIC MATERIAL FOR HALFTONE RECORDS. *British Patent 699,659.* J. A. C. Yule and R. E. Maurer. *Printing Abstracts* 9, No. 1, January, 1954, page 328. The object is to avoid the use of a separate screen of the ruled or contact type. A material is used covering the normal range of contrasts which half-tone material is called upon to produce. A uniformly thick photosensitizing silver halide emulsion layer is employed having a maximum gamma greater than four in which the emulsion is densensitized in a half-tone pattern, the maximum gamma in the desensitized areas being preferably greater than two.

A NEW ERA FOR HALFTONES. Frank Preucil. *National Lithographer* 60, *11,* November, 1953, pp. 38-39 (2 pages). A short article giving some general information about Kodalith Autoscreen Film which produces halftones without the use of the conventional contact or glass screen.

A UNIQUE FILM FOR HALFTONE NEGATIVE WITH HALFTONE SCREEN BUILT IN. R. E. Mauer and J. A. C. Yule. *Modern Lithography* 21, *12,* December, 1953, pp. 53-56 (4 pages and 2 pages of illustrations). Eastman Kodak's new process for making halftone negatives is completely described as to the characteristics of pre-screened films, characteristics of autoscreen film, the uses of autoscreen, the sharpness of detail that is obtained, cleanliness of halftones, tone reproduction, dot quality, and its limitations. This film eliminates the use of any screening methods by the photographer.

* METHOD FOR MAKING COMBINED LINE AND HALFTONE NEGATIVES. *U.S. Patent 2,665,984.* F. P.

Le Tourneau and H. E. Peterson. *Official Gazette* 678, No. 2, January 12, 1954, page 525. 1. The method of masking out portions of an image to prevent same from appearing on a film in a camera when said film is exposed which comprises; inserting a viewing glass in the position to be occupied by said film, placing a transparent sheet adjacent the rear face of said glass, securing masking material to said sheet to cover the portions of said image which are to be masked out, moving said viewing glass out of line with light causing said image, moving said sheet and mask to a position immediately forwardly of the position formerly occupied by said viewing glass, and placing said film in the position previously occupied by said viewing glass whereby said mask is adjacent said film when the latter is exposed.

A NOVEL PHOTOGRAPHIC TECHNIQUE FOR PREPARING HALFTONE MASTERS FOR DIAZOTYPE REPRODUCTION. H. Carl How. *Photographic Society of America Technical Quarterly* Series II, 1, No. 1, February, 1954, pages 13-16 (4 pages). The technique of preparing a continuous tone photographic positive transparency for duplicating use in diazotype machines has been greatly improved by introducing a magenta halftone screen. The method assures at least three steps of additional contrast range and an increase in shadow area detail not possible in ordinary processing of transparent positives. The combining of line drawings and graphs with halftone subjects is accomplished with ease. A step by step laboratory procedure of exposure, printing, and development is described.

COLOR — GENERAL

ARTISTS' COLOURS. *Patra News* 28, February, 1953, page 2. A set of water colours for use by commercial artists whose work is to be printed in three or four colours has been announced by Patra. The set of colors, Process Red, Process Yellow, and Process Blue, though adequate for most purposes, does not contain colours impossible to reproduce in three or four colours on a press.

THE THEORY OF COLOUR. G. J. Ball. *Paper and Print* 26, No. 1, Spring, 1953, pages 40-1, 43-4 & 46 (5 pages). The first in a series of articles to describe color and color phenomena to the layman. General terminology of color, the use of color atlases and the physics of color are discussed. COLOUR FOR PRINTING. *Paper and Print* 26, No. 2, Summer, 1953, pages 176, 178, 180 & 182 (4 pages).

MULTIPLE INTERNAL REFLECTIONS IN PHOTOGRAPHIC COLOR PRINTS. F. C. Williams and F. R. Clapper. *Journal of the Optical Society of America* 43, No. 7, July, 1953, pages 595-599 (5 pages). The apparent reflectance of a submerged object is strongly influenced by refraction and reflection at the surface of the submerging medium. These actions affect stain and color purities in photographic color prints, the reflecting bases of which are submerged in gelatin. Print reflection densities can be calculated from base reflectance and gelatin transmittance; a family of graphs of the relationships is presented. By a simple modification, reflectometers can be made to measure directly the reflectance of objects submerged in transparent media.

* COLOR TEMPERATURE METER AND COLOR ANALYZER. *U.S. Pat. 2,648,253.* Monroe H. Sweet. *Official Gazette* 673, No. 2, August 11, 1953, page 415. 1. An arrangement for measuring the color-temperature of a light source, comprising in combination a light responsive device producing electrical energy in direct proportion to light intensity, means between said device and the light source to be measured for alternately interposing in the path of the light beam, in rapid succession, at least two monochromatic filter elements

at a predetermined rate causing fluctuations of said electrical energy in accordance with the ratio of two spaced spectral band components in said light source, an amplifier having logarithmic transfer characteristics, circuit means for impressing said fluctuating electrical energy upon said amplifier and means for indicating the amplified energy in terms of color-temperature values, an electrical connection from the output of said amplifier to said indicating means, the indication of said indicating means, resulting from the logarithmic amplification of said impressed fluctuating electrical energy, being substantially unaffected by overall changes in the intensity of said source.

*APPARATUS FOR COLOR REPRODUCTION. *U.S. Patent 2,573,143.* C. W. Jacob. *Official Gazette* 651, No. 5, October 30, 1951, page 1419. Apparatus for producing colored pictures comprising means for atomizing a plurality of differently colored inks to form separate streams of mist containing differently colored ink particles, means for electrically charging the particles in each stream, means for establishing electrical fields and for passing each stream through one of such fields, means for varying the intensity of each field to remove varying numbers of particles from each stream, and means for moving a record-receiving medium in scanning relation to the so-treated streams so that the particles remaining in the streams may be applied to said record-receiving medium.

ELEMENTS OF COLOR PROCESS PRODUCTION. Andy Perni. *Modern Lithography* 21, No. 7, July, 1953, pages 36-37 (2 pages). This article is the first of a series planned to cover the fundamentals of color process work in offset lithography. They will aid the newcomer in the field of color, and also will provide a good basic acquaintance with color for salesmen, management men, and others.

COLOR STRIPPING ON GLASS. Clayton Reece. *Modern Lithography* 22, No. 6, June 1954, pages 52-3 (2 pages). The advantages of glass as a stripping medium for precision color process work are set forth as the author traces a typical Ektachrome job through the offset plant's stripping operations. The use of glass is a basic stripping room procedure that not only maintains accuracies already established, but quite often will enable the stripper to correct mis-register that has shown up in the camera operation.

COLOR — SEPARATION AND CORRECTION

*PHOTOGRAPHIC MASKING, COLOUR PHOTOGRAPHY. *British Patent 653,601.* Kodak, Ltd. *Abridgment of Specifications* XX, 1953, page 288. A colour or contrast correcting mask for a photographic transparency is made by sealing the transparency within two transparent sheets, one of which bears on its outer surface at least one light-sensitive emulsion layer, exposing this layer through the transparency and developing the mask therein without separating the sheets. The masked transparency may then be viewed in an illuminator or may be printed, thus corrected prints may be made with no registration difficulty and no damage to the original transparency, and the method is of particular use for copying mounted colour transparencies, which latter, after production of satisfactory copies, may be removed from their enclosing sheets and returned to the customer. Of these two sheets the unsensitized one may be of glass, but preferably both sheets are of film base material such as cellulose ester and they are stuck together around their edges with the transparency in between by adhesive, by pressure alone or by heat and especially high-frequency heating.

*MULTICOLOUR PRINTING. *British Patent 693,555.* Anton V. Jonsson. *British and Colonial Printer* 153, No. 8, August

21, 1953, page 219. This application relates to a photomechanical method of making a corrected halftone colour separation print for use in halftone colour separation print for use in multicolour printing. It is the main object of the invention to provide a method by which a satisfactory corrected halftone colour separation print for use in multicolour printing can be made with substantially little or no need for retouching the transparencies from which the corrected halftone colour separation print is to be made. Another object is to provide a method of making corrected halftone colour separation prints for use in multicolour printing by which it is possible to use only two different screen orientations for the colour separation prints, viz. one for the black colour separation print and one for the remaining colour separation prints, without any danger of moire formation in the final printed multicolour picture. The invention provides a method of making a corrected halftone colour separation print for use in making a plate for printing one of the colours in multicolour printing, and comprises making two or more different colour separation halftone transparencies of an original continuous tone colour image using the same screen with the same orientation of the screen pattern in the production of each transparency, the two or more transparencies having either negative or positive halftone images or including both negative and positive halftone images. The two or more transparencies produced are superimposed and one or more of the transparencies is moved a fraction of the distance from centre to centre of two adjacent dots in the screen pattern out of register with the other one or more transparencies and a print is made of the transparencies while they are superimposed and out of register with each other.

ELEMENTS OF COLOR PROCESS REPRODUCTION. MASKING THE DIRECT SEPARATION NEGATIVES. Andy Perni. *Modern Lithography* 21, No. 9, September, 1953, 40-1 (2 pages). Some practical aspects of preparing continuous tone color separation negatives are given by the author. These include dimensional stability, sensitivity, speed, contrast, exposure and development of the separation negative.

COLOUR MASKING. D. O. Holt. *Modern Lithographer and Offset Printer* 49, 9, September, 1953, pp. 29-32 (4 pages). Masking is needed because not all colours photograph as desired and because of known deficiencies in printing inks. Broadly, this means that surplus red has to be removed from greens, and yellow from blues and purples, but care must be exercised against over-correction resulting in loss of tone in brown and dirty colours. Much of the good work in colour masking is going to be undone because of the inefficiency of the conventional halftone screen. For while colour correction and other saturation may have been improved by masking, a great deal of tone correction must inevitably be done by hand. Therefore, jobs to be masked must be decided on these lines: (a) In flat copy masking should only be used when it is obvious that the etcher will have difficulty in differentiating between adjacent colours when painting out; (b) It is generally worth while to mask carpets and textiles if photographed direct from the articles, but a decision need not be made until after the critical negative whichever it may be, has been made. (Incidentally this negative should be made first; for if masking is to be used, the balance of the entire set will have to be adjusted.); (c) Nine out of ten transparencies benefit from some masking whether it be purely for contrast or for colour correction. Masking becomes more economical if it can be installed as a separate department which has a continuous flow of work. To mask one job on its own wastes a great deal of the operator's time. because of the delays caused in washing and drying, but if he can work in two or more sets together, it is far more efficient.

ELEMENTS OF COLOR PROCESS REPRODUCTION. MASKING DIRECT SEPARATIONS. Andy Perni. *Modern Lithography* 21, No. 10, October, 1953, pages 64-5 (2 pages). The article deals with masking direct separations and defines masking and color correction masking. A detailed stepwise set of operations for producing these masks is given.

SEPARATION NEGATIVES. REGISTERING OF MASKS. Bob Hanks. *National Lithographer* 60, No. 10, October, 1953, pages 64-65 (2 pages). A simplified method of registering the masks for color separations is discussed with the subject being limited to the Eastern system.

ELEMENTS OF COLOR PROCESS REPRODUCTIONS. 2. FILTERS, FILTER FACTORS AND GRAY SCALES. Andy Perni. *Modern Lithography* 21, No. 8, August, 1953, pages 40-41 and 123 (3 pages). The use of filters, filter factors, and gray scales in color separation work is described.

*ELECTROCHEMICAL COLOR FILTER. *U.S. Patent 2,632,045.* G. C. Sziklai. *Monthly Abstract Bulletin* 39, No. 11, November, 1953, page 549. A color filter is described in which the color is controlled electrically. The filter consists of a glass cell containing a liquid which changes color with pH (i.e., an indicator) and whose pH changes when current flows through the liquid.

IBID., 5. MASKING AND SEPARATIONS FROM TRANSPARENCIES. Andy Perni. *Modern Lithography* 21, No. 11, November, 1953, pages 59-60 (2 pages). A simplified, clear description of masking with color transparencies is given. Film, developers, and filters are recommended for good separations. For details, Eastman Kodak's "Masking for Photomechanical Reproduction" should be used as the reference.

IBID., 6. CONTINUOUS TONE RETOUCHING FOR SEPARATION NEGATIVES. Andy Perni. *Modern Lithography* 21, No. 12, December, 1953, pages 44-45 (2 pages). The common faults in transparencies are enumerated and appropriate methods for color correction retouching are listed to correct these faults. Uncorrected separation negatives give a final result that is around 65% accurate while corrected negatives give results as high as 90% correct.

IBID., 7. MAKING HALFTONE POSITIVES (CONCLUSION OF SERIES). Andy Perni. *Modern Lithography* 22, No. 1, January, 1954, pages 45 and 113 (2 pages). The production of halftone positives from the separation negatives is discussed, with approximations for producing good positives based upon the preparation of the separation negatives described by the author in six previous articles in this publication.

FALLACIES IN COLOR REPRODUCTION. Frank Preucil. *Graphic Arts Monthly* 26, No. 5, May, 1954, pages 74, 76, 78 and 80 (4 pages). The author criticizes some of the practices in color separation and color correction in the graphic arts industry. It seems that in color correction methods attention is always focussed on corrections for the pure clean colors—no magenta in the greens or yellows in the purples. These conditions can be met but still not reproduce perfectly since most of the areas are grayed colors and masking alters grayed color as much as the pure colors. Either separate masking controls must then be exercised for gray balance, or the relative running ink strengths must be rearranged to suit the masking conditions actually used.

PRACTICAL METHOD FOR DETERMINING COLOR CORRECTION MASKING. H. Brent Archer and Warren L. Rhodes. *Modern Lithography* 22, No. 5, May, 1954, pages 98-9, 101, 103 and 105 (5 pages). A technique is presented for determining the color-correc-

tion masking suitable for a given set of printing conditions. The method described is based upon the reproduction of a test chart made up of the inks intended for later reproductions. A test object is prepared in a logical way so that the ideal separations for their reproduction are known. Separation negatives are made of the test object in the regular manner. These negatives are then measured with a densitometer, and the results plotted upon a graph in a special way. The resulting Separation-Negative Diagram provides a quantitative indication of the color-correction masking needed for that negative.

PHOTOTYPE

* PHOTOGRAPHIC COMPOSING APPARATUS. *U. S. Patent 2,652,755.* Rene Higonnet and Louis Moyroud. *Official Gazette* 674, No. 4, September 22, 1953, page 933. 1. In photographic type composing apparatus, the combination of a rigid character carrier, continuously rotatable in one direction and bearing the characters to be photographed and corresponding code areas, each code area comprising a representative combination of transparent and opaque sub-area and having an edge in precise spatial relation to a point in a corresponding character, a fixed illuminate object, means for focusing on the character carrier a stationary image of said object corresponding substantially in size and shape to a code area and having an edge in position to become coincident with said edges of each of the code areas successively, means for selectively blocking sections of the object corresponding to the combination of sub-areas representing a single selected character, a single photo electric device to receive light passing through the transparent sub-areas, and projection means actuated by the photoelectric device when said light is reduced substantially to zero by reason of said edges of the selected code area and image reaching coincidence, to project the code-selected character on to a sensitized surface.

* METHOD FOR CORRECTION AND MAKE-UP OF TYPE MATTER FOR PLANOGRAPHIC PRINTING PROCESSES. *U. S. Patent 2,659,282.* Herman R. Freund. *Official Gazette* 676, No. 3, November 17, 1953, page 724 1. A method of preparing a form from which a printing plate can be made, said form comprising lines of type matter of the same or different type sizes produced on a film or paper sheet in columnwise succession in a photocomposing machine, which comprises perforating the sheet marginally within its edges and opposite the ends of each line when produced thereon and while the sheet is fixed on the optical projection axis for the respective lines; utilizing the perforations related to any faulty line to locate such line relative to a punch and punching from the sheet, between said perforations, a rectangular strip bearing the faulty line; utilizing perforations similarly made and related to a corrected line produced on a secondary sheet to locate such line relative to the punch and punching as aforesaid from this sheet a rectangular strip of the same size bearing the corrected line; inserting the corrected line-strip in the rectangular opening in the first sheet where the faulty line-strip is removed by utilizing the walls of said opening as abutments for locating the inserted line-strip in the plane of said sheet, and securing the inserted line-strip to said sheet.

* OPTICAL SYSTEM FOR PHOTOGRAPHIC COMPOSING APPARATUS. *U.S. Patent 2,670,665.* Samuel H. Caldwell. *Official Gazette* 680, No. 1, March 2, 1954, page 117. 1. In photographic type composing apparatus, the combination of a collimating lens, means for putting in the focal plane of the collimating lens an image of the character to be projected, an illuminating device to project the images of selected characters forming a line successively through the collimating lens, each character having a predetermined width value and being projected while it is in the projection position, a trans-

lating lens combination including a converging lens and a reflector arranged one behind the other to focus the projected light and reflect it through a predetermined angle, a support to hold a sensitized surface in substantial coincidence with the focal plane of the light leaving the lens combination, and means for displacing the lens combination relative to the collimating lens and longitudinally of the surface after each projection by variable distances proportional to the widths of the corresponding characters, whereby each character is focused upon the surface irrespective of the relative positions of the two lenses.

"MONOPHOTO". *Modern Lithographer and Offset Printer* 49, No. 12, December, 1953, pages 13-14 and 16-17 (4 pages). A complete description of the Monophoto photo-type-setting machine is given plus a diagram of the optical system used. This machine could eliminate metal typesetting and if perfected, could be used not only in offset and gravure, but also for letterpress. The instrument saves on time, cleanliness, proofing, and correction techniques.

* APPARATUS FOR COMPOSING JUSTIFIED LINES. *U.S. Patent 2,664,986.* René Higonnet and Louis Moyroud. *Official Gazette* 678, No. 1, January 5, 1954, page 174. 3. In apparatus for composing justified lines of written matter, a device for controlling the justifying space increments to be added to a line of selected characters to be spaced in succession, comprising a lever rotatable about a fixed axis, a linearly movable follower, means for moving the follower to a position at a distance from said axis corresponding to the aggregate of said space increments a counting device for counting said space increments by successive movements, means for holding the lever and follower in mechanical contact with the counting device after said movement of the follower, means for holding the lever rigid after said contact is established, a character displacement mechanism mechanically coupled with the follower, and means for moving said counting device by successive movements equal to but opposite in direction from said counting movements, whereby the follower is moved by successive displacements to said position.

* APPARATUS FOR TYPE COMPOSITION. *U.S. Patent 2,664,038.* George E. Canham. *Official Gazette* 677, No. 5, December 29, 1953, page 1238. 1. In automatically operated camera apparatus in which a film web is exposed and then advanced with a juxtaposed paper web to cause development of the film and printing on the paper web within the camera upon advance of the film to take a succeeding picture, electrically driven means for advancing the film between exposures, a switch in circuit with said electrically driven means and closed for a fixed interval of time to energize said means, said interval of time being longer than that required to advance the film between exposures, a movably mounted pin adapted to be received within a perforation in one of the webs so as to be carried with the webs for a short distance, and an electrical switch actuated by the movement of said pin in the direction of travel of said webs for interrupting an electrical circuit to the film-advancing means.

* PHOTOGRAPHIC TYPE-COMPOSING. *British Patent 674,344.* Monotype Corporation, Ltd. *Abridgement of Specifications* XX, 1954, pages 224-5. In a record-strip controlled photo-mechanical typographic composing machine, wherein all the characters of a particular lay-out or fount are represented as transparent images on an opaque background, or vice-versa, and the characters of one unit value or width are arranged in the same column or row, there is combined with the main character dimensioning mechanism a supplementary dimensioning mechanism variably and selectively operated under control of the record-strip to augment

the width or unit value allotted by the main dimensioning mechanism to any character.

DEMONSTRATE LINOFILM PHOTO-TYPESETTING MACHINE. *National Lithographer* 61, No. 5, May, 1954, page 46. A new type of phototypesetter composed of two units, one containing the keyboard unit and the other, the photographic unit. Several methods of correction are incorporated to save time and money. A full library of type faces will be available in 1955 when Mergenthaler markets this new machine.

PHOTOGRAPHIC PROVING

DYE PROVING. Andrew J. George. *Pacific Printer and Publisher* 91, No. 6, June, 1954, page 19. A step-by-step procedure on dye proving is described for preparing full-color proofs using a minimum of time. The causes of errors are listed and their remedies are given. Regardless of variation between these proofs, they are still a good guide for the dot etcher.

PHOTOGRAPHIC COLOR PROVING. Franklyn R. Payer. *National Lithographer* 61, No. 5, May, 1954, pages 40-41 (2 pages). The article concerns itself with a "positive" method of making a color transparency or print. The silver-bearing gelatin of a "positive" is hardened by the action of the bleaching bath, after which the entire positive is dyed with any acid or azotype dye. Although the dye is absorbed by all the gelatin, only the hardened portion retains the color in the subsequent washing.

GENERAL

*WRITING ROD FOR A PLANOGRAPHIC IMAGE FORMING PENCIL. *U.S. Pat. 2,634,214.* C.H.Van Dusen and O.E.Weissenborn. *Chemical Abstracts* 47, No. 11, June 10, 1953, Column 5585. A rod for an image-forming planograph pencil is described. Thus, 35 parts by weight of Nigrosine and 40 parts of Al stearate are mixed and then dissolved in 27.6 parts of methylcellulose solution. (1 part methylcellulose in 6 parts H_2O) with 2-3 hours of mixing. Two parts of Japan wax is melted and added to the mixture with mixing for three hours. The mixture is then extruded in cylindrical rods and dried to 3% H_2O content. These rods may be used in forming planographic images upon master planographic printing plates including Al or paper.

*USE INTERFEROMETER FOR SENSITIVE CORROSION MEASUREMENTS. *Ceramic Industry* 61, July, 1953, page 62. An interferometer procedure is being used at the National Bureau of Standards for studies of the corrosion resistance of such materials as porcelain enamel, optical glass, quartz and other natural and artificial silicates, and various metals. The method is believed to have value for comparing and predicting the chemical durability of various materials. *Telescoping the Technical News* 11, No. 2, October 20, 1953, page 44. Ceramic Industry is published by Industrial Publications, Inc., 5 S. Wabash, Chicago 3, Illinois.

*ELEMENTS OF PHOTOLITHOGRAPHY. *British Patent 694,224.* G. F. Nadeau and C. B. Starck. *Tin Printer and Box Maker* 29, No 346, November, 1953, page 14. A metal foil and a layer of cellulose or formic acid ester are bonded together by an interlayer comprising a copolymer of vinyl chloride, vinyl acetate and an *alpha-beta*-ethylenically unsaturated dicarboxylic acid. The layer contains an antihalation dye and has a hydrolised stratum on its outer surface. The metal foil has the outer surface covered with a protective layer of a copolymer of vinyl chloride, vinyl acetate and an *alpha-beta*-ethylenically unsaturated dicarboxylic acid.

PLATEMAKING FOR PROCESS WORK. Paul J. Hartsuch. *Graphic Arts Monthly* 25, No. 11, November, 1953, pages 66, 68, 71-2 (4 pages). Discussion of some of the variables encountered and the requirements for obtaining quality color reproduction, one of the most important requirements being close co-operation between photographer, platemaker and pressmen. Mention is made of two LTF publications on platemaking and the use of the Sensitivity Guide.

*PROCESS FOR PRODUCING LITHOGRAPHIC PRINTING PLATES. *U. S. Patent 2,637,939.* W. J. Hausman. *Official Gazette* 670, No. 2, May 12, 1953, page 390. 1. A process for producing a lithographic plate which comprises brushing one side of a sheet of at least 99% pure aluminum with a first brush having relatively coarse steel bristles to tear the skin of the sheet and to form a coarse grain, brushing said side of said sheet with a steel brush having relatively finer bristles to subdue the coarse grain formed by said first brush, immersing said sheet in a saturated aqueous solution of calcium hydroxide maintained at a temperature between 175° F. and 185° F. for a period of from about 25 seconds to about 55 seconds, and water scrubbing and drying said plate.

* ETCHING OF PRINTING PLATES. *U. S. Patent 2,647,864.* Daniel L. Goffredo. *Chemical Abstracts* 47, No. 20, October 25, 1953, Column 10772. The top member of a bimetallic plate is made of a metal lower in the electromotive series than the base material. If a copper-plated zinc plate is used, the copper is removed under the nonresistant portion of the resist by chemical methods. The exposed portion of the zinc is then etched by a blast etch to produce the relief image. A suit-

able etchant contains 300 g. $CuSO_4$ per liter of water, 10 cc. concentrated HNO_3 as oxidizer, 100 cc. aerosol OT (aqueous solution of dioctyl Na sulfosuccinate), 10 grams Na carboxymethylcellulose as additives, and 10 grams clay as abrasive. Copper is deposited from the solution and adheres to the edges of the etched pits. As oxidizer H_2O_2 or $NaNO_3$ can also be used. Other additives are gelatin, detergents, and thickeners. For zinc-coated magnesium plates, suitable etchants contain $ZnCl_2$ and $CuCO_4$ or HCl and $CuSO_4$.

* PROCESS FOR PRODUCING POSITIVE PHOTOLITHOGRAPHIC PRINTING FOILS. *U. S. Patent 2,667,415.* W. Neugebauer and J. Barthenheier. *Official Gazette* 678, No. 4, January 26, 1954, page 1051. 1. The positive working process for producing lithographic printing plates from light sensitive material having a hydrophilic surface which has been photo-sensitized with a diazo compound of high molecular weight which upon direct exposure to light decomposes into a greasy ink receptive substance, said process comprising the steps of applying an aqueous colloidal solution of water soluble organic colloid to said sensitized hydrophilic surface to cover said sensitized surface with a water soluble organic colloid layer, exposing said sensitized hydrophilic surface provided with said water soluble colloid layer to a light image, removing said water soluble colloid layer and completely re-exposing said sensitized hydrophilic surface to light.

* PRINTING PLATE PREPARATION. *U. S. Patent 2,663,639.* W. H. Wood and D. N. Adams. *Official Gazette* 677, No. 4, December 22, 1953, page 1066. 1. A new composition of matter for light sensitive coating of lithographic printing plates, said composition comprising a 6 to 18% water solution of albumen, a dichromate light sensitizing agent, ethanedial in the proportion of about 2.5 to 5.1% ethanedial to the albumen based on the dry weight of the albumen, and sufficient alkali to adjust the pH to about 9.0.

* PHOTO MECHANICAL PRINTING PLATE. *British Patent 662,708.* T. I. Archer. *Abridgement of Specifications* XX, 1954, page 42. A stainless steel plate is degreased as with benzole, cleaned with water and whitening, treated by an anodizing process, washed, copper plated electrolytically as in acidified copper sulphate solution, washed, coated with bichromated polyvinyl alcohol as in a whirler, exposed under a negative, washed and dried, treated in an iron perchloride bath to remove the copper background, washed, and treated in a stencil removing bath to remove the bichromated polyvinyl alcohol image, to result in a plate in which the copper image inks up lithographically.

* METHOD OF MAKING PLANOGRAPHIC PRINTING PLATES. *U. S. Patent 2,678,299.* Charles F. Geese and Donald B. Lytle. *Official Gazette* 682, No. 2, May 11, 1954, page 471. 1. A method of depositing a water-receptive chromium surface layer for a bimetallic planographic printing plate, comprising immersing a plate having a smooth, ungrained metal surface in a chromium plating bath containing chromium trioxide and sulfate ions in a ratio of about 100 to 1, passing electric current between an anode and the plate as a cathode, at a selected current density between about ¾ ampere and 10 amperes per square inch for a period of about 1 to 3 minutes, interrupting the current for a period of about 15 to 60 seconds, again passing the current between the anode and the plate for an additional period of 20 to 60 seconds, to deposit a layer of dull, fine-grained chromium on said ungrained surface, the temperature of the bath being maintained, at said selected current density per square inch, within the range defined by the following limits:

95° F. to 97.5° F. at 0.75 ampere(s)
95° F. to 102.0° F. at 1.0 ampere(s)

95° F. to 112.5° F. at	1.5	ampere(s)
95° F. to 122.0° F. at	2.0	ampere(s)
102° F. to 129.0° F. at	3.0	ampere(s)
109° F. to 130.0° F. at	4.0	ampere(s)
117° F. to 131.0° F. at	5.0	ampere(s)
118° F. to 132.0° F. at	6.0	ampere(s)
119° F. to 133.0° F. at	7.0	ampere(s)
120° F. to 133.5° F. at	8.0	ampere(s)
121° F. to 134.5° F. at	9.0	ampere(s)
122° F. to 135.5° F. at	10.0	ampere(s)

* METHOD OF PRODUCING PRINTING PLATES. *U. S. Patent 2,676,886.* Robert Barbarite. *Official Gazette* 681, No. 4, April 27, 1954, page 1091. 3. The method of producing printing plates for planographic, offset printing machines which comprises the steps of applying a light-sensitive colloid to the surface of a metallic printing plate, said colloid containing an inhibiting agent comprising a substance selected from the group consisting of potassium iodide and ammonium thiocyanate for forming with copper a copper compound highly insoluble in both alcohol and water to thereby prevent the copper being deposited on said plate from penetrating said colloid, reproducing the desired picture on the sensitized surface, developing the surface to expose image-bearing areas on said plate, and depositing on the image-bearing areas of said plate an adherent, substantially pure layer of copper by subjecting said plate to an acidic, alcoholic salt solution of copper.

* DEVELOPING HEAD FOR PHOTOLITHOGRAPHIC PLATE. *U. S. Patent 2,677,320.* Harry A. Coughlin. *Official Gazette* 682, No. 1, May 4, 1954, page 121. 1. In a photolithographic plate treating machine for removing excess non-printing ink from the plate, a panel to support the plates moved through the machine, a movable hollow body extending substantially the width of said plate supporting panel, drive means relatively loosely connected with said body for moving the same in a circular orbit over said panel on which the plates move, a blanket carried on said body covering said bottom face, said blanket being of a character receptive to the printing ink and consisting of pile fabric of wool cut plush with a tightly woven warp and weft forming a firm ground texture, and conduit means connected with said body supplying a fluid at relatively low pressure thereto for flow through said perforated bottom face, the fluid escaping through the said blanket and simultaneously distending the blanket into a position yieldable to the thickness of the plate and erecting the filaments of the pile cut plush into gentle yielding contact with the plate and flushing away the excess of the non-printing ink contacted and loosened by the distended filaments, the pressure of said fluid distending said blanket causing said loosely connected body to assume a position relative to said drive means for controlling the pressure of contact of the filaments with the plate.

SUMMER PROBLEMS. Carl Eisentraut. *Graphic Arts Monthly* 26, No. 5, May, 1954, pages 106, 109, 110, 112, 114 (5 pages). During the summer months, if preventative measures are not taken, temperature and RH can bring on a host of troubles. A few of such troubles are listed and also what measures should be taken.

* PLANOGRAPHIC PRINTING. *U. S. Patent 2,681,617.* S. V. Worthen and C. H. Van Dusen, Jr. *Official Gazette* 683, No. 4, June 22, 1954, page 829. 1. In the art of preparing direct image planographic printing plates, the improvement which consists in providing a paper or like cellulosic base sheet with a planographic base coating having therein finely divided pigment particles, applying directly upon the external surface only of said planographic base coating an auxiliary coating consisting of a water dispersion of a finely divided hydrophilic water insoluble non-reactive mineral pigment in the form of a silica aquasol. and then bonding the pigment particles of the said water dispersion to the said base coating by drying to form a discontinuous deposit of discrete particles of said finely divided mineral pigment over the entire external surface only of said planographic base coating.

3. In the art of printing from a direct image coated planographic paper or like cellulosic base planographic printing plate provided with a hydrophilic planographic image-receptive surface having thereon greasy hydrophobic images defining printing portions, the improvement which resides in printing from the said image-bearing planographic printing plate, applying to the said printing surface of said direct image planographic printing plate, after printing therefrom, a clean-up and plate preservative composition composed of a water dispersion of a finely divided water-insoluble non-reactive water-wettable hydrophilic mineral pigment whereby to cover only the unimaged areas thereof, drying the thus treated planographic printing plate, and then reprinting from the said treated and dried planographic printing plate without removing the said clean-up and plate preservative composition from the unimaged areas thereof prior to the said reprinting operation.

PLATE COATING

CRACKED COATINGS ON DEEP-ETCH PLATES BOTHERSOME. Charles F. King. *Inland Printer* 132, 2, November, 1953, pp. 49-50 (2 pages). A survey of the replies to the author's request for readers' experiences with cracked deep-etch coatings is given. While the reports did not indicate any one particular cause, several possible causes were suggested. Among them were dehydration of the coating by the alcohol wash, variations in the coating thickness, and variations in the plate surface and grain.

*SENSITIVE COATINGS FOR COPYING ON METAL. *French Patent 1,018,053.* W. Mauss, M. Kuhl and B. Ostersetzer. *Procédé* 49, Nos. 7-8, 1953, pages 62-3 (in French); *Printing Abstracts* 8, No. 11, November, 1953, page 587. The following are used as colloids: the polymers of acrylamide or their derivatives with alkyl groups substituted for the nitrogen, or the copolymers or acrylamides and of vinyl compounds, sensitized by bichromates, diazo compounds or azides, the latter permitting the preservation of the sensitized metal for long periods. One of seven examples is: In 100 parts of a 5% solution of polyacrylamide and 4% polyvinyl alcohol in water, dissolve 0.9 parts of sodium 4:4[1]—diazidostilbene—2:2[1]—disulphonate. Apply this to the metal on a whirler. After drying and exposure to the light, the plates are dyed rapidly in a 4% solution of Sirius blue and developed by washing in water which only dissolves the areas protected from the light. For lithographic printing, the copy having been made under a positive, first an alcohol varnish then a greasy ink are distributed and the temporary resist is then eliminated by means of a brush moistened with water. French Patents may be obtained from Imprimerie nationale, Rue de la Convention 27, Paris (15e) for 15 fr plus 7 fr postage.

*COMPOSITION FOR LITHOGRAPHIC PLATE COATINGS. *U. S. Patent 2,677,611.* Vernon L. Gregory and Leonard R. MacDonnell. *Official Gazette* 682, No. 1, May 4, 1954, page 206. 2. An image forming coating composition for photolithographic plates comprising a water-soluble caseinate, a light sensitive bichromate, and a natural saturated fat which will form a fatty emulsion in the presence of water.

MATERIALS AND METHODS

HOW TO MAKE AND RUN DEEP-ETCH PLATES, GRAINED ZINC. Robert F. Reed. *Lithographers Journal* 38, No. 4, July, 1953, pages 16-19 (4 pages). Instructions on making deep-etch plates on zinc which include all improvements introduced since the original LTF Bulletin issued in 1934.

*METHOD OF MAKING A HYDROLYZED CELLULOSE ESTER PRINTING PLATE. *U. S. 2,607,683.* E. C. Yackel and C. F. Amering. *Monthly Abstract Bulletin* 39, No 3, March, 1953, page 165. A process for making a photolithographic printing plate includes coating a film of cellulose ester with a layer of

a mixture of a hydrophilic organic colloid containing silver halide and an aqueous colloidal dispersion of a water-insoluble soft acrylate resin, exposing the sensitive layer, developing the exposed layer under conditions of tanning development, and treating the developed layer with hot water to swell the layer in the exposed regions and to remove hydrophilic colloid from the unexposed regions, followed by treating the layer with hydrolyzing solution to hydrolyze the portions of the cellulose ester support beneath the exposed regions, and removing all of the colloid layer from the support. The result is to obtain a printing plate in which the hydrolyzed areas serve to repel greasy printing inks, and lithographic prints are obtained by printing from the other ink-receptive areas of the plate.

*LITHOGRAPHIC PRINTING PLATES. *U. S. 2,637,929.* Walter J. Hausman. *Chemical Abstracts* 47, No. 16, August 25, 1953, Column 8291 Lithographic printing plates of very long lifetime and improved moisture resistance are produced by brushing a sheet of at least 99% pure Al with rotating steel bristles 0.09-0.05 inch in diameter and a peripheral speed of approximately 1400 ft./min., treating these plates in a bath of saturated $Ca(OH)_2$ solution at 180° F. for 35-40 seconds, and scrubbing the plates with fiber bristles under a spray of water and drying.

*ELASTIC BASES FOR LITHOGRAPHIC PLATES. *German Patent 811,233.* Karl Blättner and Hans Alix. *Chemical Abstracts* 47, No. 16, August 25, 1953, Column 8291. Elastic layers made of gums, synthetic resins, etc., with addition of graphite, metal powders, $CaCl_2$, glycerol, etc. are suitable for lithographic printing on coarse or grained paper. In order to make the surface of the image accept the paint, electrical, chemical, or physical methods may be used. The layer containing the added material of good electrical conductivity is submerged in a galvanic bath, and the image-free places are covered with a layer of a suitable metal like Cr which is a good paint repellent. By another method, a layer which contains zinc or aluminum dust is chemically etched to make the image repel the paint. The addition of $CaCl_2$, protein, glycerol, etc., imparts hygroscopic properties to the elastic layer. Heat or suitable reagents make the image paint-receptive. German patents may be secured as photoprints from the U. S. Patent Office, Washington 25, D. C.

A METHOD FOR THE DETERMINATION OF THE BICHROMATE CONCENTRATION IN SENSITIZING SOLUTIONS. G. E. Carlsson and I. Olsson. *Grafiska Forskningslaboratoriet* No. 31, January, 1953, pages 57-8 (2 pages) (in Swedish). A simple method for the determination of the bichromate concentration by reduction with iodide and titration with sodium thiosulphate is described. *Printing Abstracts* 8, No. 5, May, 1953, page 245.

*GUM ARABIC. *Adhesives and Resins* 1, No. 3, June, 1953, pages 91-5. Sources, processing, and marketing are discussed. *Printing Abstracts* 8, No. 8, August, 1953, page 399.

*PHOTOGRAPHICALLY PRODUCED PRINTING PLATES. *British Patent 695,197.* L. M. Minsk and W. P. Van Deusen. *Printing Abstracts* 8, No. 10, October, 1953, pages 535-6 An insolubilized polymeric cinnamic acid (including a ring-substituted derivative thereof) or a furylacrylic acid ester of polyvinyl alcohol or cellulose (preferably polyvinyl cinnamate) is used as a resist in the production of blocks or litho plates (e.g. zinc or copper halftone blocks, chromium-copper bimetallic litho plates and cellulose acetate, zinc or aluminium litho plates).

*METHOD OF PRODUCING ETCHED PRINTING PLATES. *U. S. Patent 2,650,878.* Mahlon R. Boyer and Arthur W. Grumbine. *Official Gazette* 674, No. 1, September 1, 1953, page 208. 1. A process of making an etched print-

ing plate from a dry-stripping film having a gelatino silver halide emulsion layer carried by a thin hydrophobic cellulose derivative support which is adhesively joined to a temporary support by a dry-stripping layer, comprising exposing the emulsion layer separately through a screen and to a photographic picture, developing the exposed film in a hardening developer, fixing said developed film, bleaching the resulting film with an aqueous solution containing a water-soluble alkali metal salt of an acid which forms an insoluble silver salt image readily soluble in thiosulfate solutions, drying the bleached film, pressing the bleached gelatin silver salt layer into contact with the wet surface of a metal printing member, stripping the temporary support from the remaining support, dissolving the latter support, washing the unhardened gelatin from the gelatin layer whereby a relief image is formed and treating the relief image with an acid etching solution whereby an image is etched into the surface of said printing member.

KODAK PHOTO RESIST. *National Lithographer* 60, *11*, November, 1953, pp. 42-4 (3 pages). Describes procedure for making a zinc plate and advantages of the process. The material, when dried, is stable, waterproof, acid and alkali resistant. Two developing techniques—development board (and how to make it) and a vapor degreaser are also described.

SOME THOUGHTS ON PLATE LACQUERS. Grant C. Beutner. *Modern Lithography* 22, *1*, January, 1954, pp. 48-50 (3 pages). A breakdown and discussion of the components of a deep-etch lacquer and recommendations for formulating a lacquer that would meet certain basic requirements.

* ETCHING MACHINE. *U. S. Patent 2,669,048.* J. A. Easley, W. E. Eden and H. E. Swayze. *Official Gazette* 679, No. 3, February 16, 1954, pages 575-6. 1. In an etching machine for etching printing plates, the combination of a tank adapted to contain a liquid etching composition; a series of paddle blades having horizontal parallel axes lying in a plane above the upper surface of the etching liquid in the tank when filled to its working level and adapted on being revolved to splash the etching liquid about the tank; upstanding baffles between the said paddle blades adapted to guide the splashed etching liquid in a generally vertical direction; a removable cover adapted to form a closure for the top of the tank so as to prevent escape of etching liquid on being splashed in the tank; a work holder plate above the baffles below the underside of the cover; motor means on the top of the cover adapted to impart to the work holder simultaneously a translatory and rotational motion in a horizontal plane.

* GUM ARABIC. J. Morris. *Adhesives & Resins* 1, No. 8, November, 1953, pages 243-9. The grades of gum arabic available, the viscosity of gum arabic solutions and its commercial uses are discussed. Phenol and benzoic acid are used as preservatives. *Printing Abstracts* 9, No. 1, January, 1954, page 280. Adhesives & Resins is published by A. S. O'Connor & Co., Ltd., 329 Gray's Inn Rd., London, W. C. 1, England.

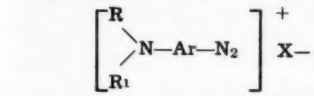
* MANUFACTURE OF DIAZO SENSITIZED PAPER PRINTING FOILS FOR PHOTO-LITHOGRAPHIC PURPOSES. *British Patent 697,521.* Kalle and Company. *Printing Abstracts* 8, No. 11, November, 1953, page 586. The paper is coated with a diazo compound in an aqueous liquid which is free from coupling components and free from colloidal substances tannable by diazo compounds under the action of actinic light. The light-decomposition products of the specified diazo compounds are themselves capable of accepting greasy inks.

* DIAZOTYPE PROCESSES AND MATERIALS FOR PRODUCING PHOTOMECHANICAL PRINTING PLATES. *British Patents 699,412-699,413.* A. G.

Kalle and Company. *Printing Abstracts* 9, No. 1, January, 1954, page 290. A plate having a layer containing as light-sensitive constituent a water-insoluble ester or water-insoluble substituted amide of a sulphonic or carboxylic amide of 2-diazonaphthol-(1) or 1-diazonaphthol-(2) is exposed under an original and the exposed plate developed with an alkaline solution to remove the diazo compound which has been acted upon by light (A) or 1-diazonaphthol-(2) or 2-diazonaphthol-(1) is exposed under an original and the exposed plate developed to cause the diazo compound unacted upon by light to form an azo dye by coupling with an azo coupling component (B).

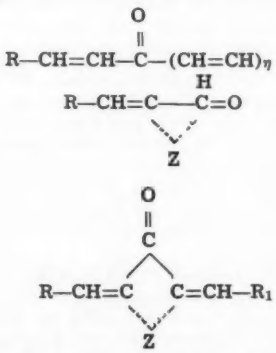
CHEMISTRY

• PAPER PRINTING FOILS FOR LITHOGRAPHIC PURPOSES AND A PROCESS OF PREPARING THEM. *U. S. Patent 2,649,373.* Wilhelm Neugebauer, Jakob Barthenheier, and August Rebenstock. *Official Gazette* 673, No. 3, August 18, 1953, page 789. 1. A photosensitive coated paper product suitable for the photolithographic manufacture of greasy ink receptive planographic printing plates which product comprises a paper base, selected from the group consisting of parchmented papers and papers coated with a coating composition comprising mineral filler and adhesive, which paper base has a uniform surface having planographic printing properties, and a top coating thereon free from coupling components and free from colloidal substances tannable by diazo compounds under the action of actinic light, said coating comprising a diazo compound which on exposure to actinic light yields an oleophilic decomposition



product and is selected from the group consisting of sulfonates obtained by reaction of a sulfite upon compounds selected from the group consisting of (1) the diazonium salts corresponding to the formula wherein X stands for an equivalent of an anion of an acid, Ar stands for an aromatic residue selected from the group consisting of phenylene and phenylene substituted by a member of the group consisting of alkyl, alkoxy, aroxy, arylsulfamido and halogen, R stands for a member of the group consisting of aryl, and its alkyl, alkoxy, halogen and carboxyl substitution products, and R_1 stands for a member of the group consisting of H and alkyl, and (2) the condensates of (1) with aldehydes.

• OPTICAL SENSITIZATION OF PHOTOMECHANICAL RESISTS. *U. S. Patent 2,666,701.* William West. *Official Gazette* 678, No. 3, January 19, 1954, page 794. 1. A photomechanical resist composition comprising as the light-sensitive material a ketone selected from the group consisting of those ketones represented by the following general formulas:



wherein R and R_1 represents a member selected from the group consisting of an aralkyl group, an aryl group and a furyl group, η represents a positive integer of from 1 to 2 and Z represents the nonmetallic atoms necessary to complete a carbocyclic ring, the composition containing as a spectral sensitizer for the composition a dye selected from the group consisting of thiacarbocyanine,

dibenzothiacarbocyanine, thiazolocarbocyanine, selenacarbocyanine and azathiacarbocyanine dyes.

* PHOTOSENSITIZATION OF POLYMERIC CINNAMIC ACID ESTERS. *U. S. Patent 2,670,285.* L. M. Minsk, W. P. Van Deusen and E. M. Robertson. *Official Gazette* 679, No. 4, February 23, 1954, page 988. 1. A photomechanical resist composition comprising a polymeric material selected from the group consisting of cinnamic acid esters of polyvinyl alcohol and cellulose as a combined carrier and light-sensitive material, and as a light-sensitizing agent for the composition, a compound selected from the group consisting of anthrones, benzanthrones and azabenzanthrones, free of basic nitrogen-containing substituents and hydroxyl in a position peri to an oxo group of said compound, carboxyl and sulfo groups.

* IBID. *U. S. Patent 2,670,286.* 1. A photomechanical resist composition comprising a polymeric material selected from the group consisting of cinnamic acid esters of polyvinyl alcohol and cellulose as a combined carrier and light-sensitive material, and as a sensitizer for the composition, a polynuclear quinone free of basic nitrogen-containing groups, hydroxyl, carboxyl and sulfo groups.

* IBID. *U. S. Patent 2,670,287.* 1. A photomechanical resist composition comprising a polymeric material selected from the group consisting of cinnamic acid esters of polyvinyl alcohol and cellulose as a combined carrier and light-sensitive material, and a compound selected from the group consisting of diaminobenzophenone imides, diaminodiphenyl methanes, diaminodiphenyl ketones, and diaminodiphenyl carbinols as a light-sensitizing agent for the composition.

* PHOTOSENSITIVE RESIN COMPOSITION. *U. S. Patent 2,673,151.* H. L. Gerhart. *Official Gazette* 680, No. 4, March 23, 1954, pages 1050-1. 10. As a new composition of matter, a copolymerizable mixture of (A) a polyester of an ethylenically unsaturated, alpha-beta dicarboxylic acid and a dihydric alcohol, (B) a polymerizable ethylenically unsaturated compound and (C) an effective amount of a photosensitizing agent which is an organic, sulfur-containing, rubber vulcanization accelerator in effective amount.

METAL SURFACES

* CORROSION INHIBITOR CHECK-LIST. Maxey Brooke. *Chemical Engineering* 59, Sept., 1952, pages 286-7 (2 pages). Covers representative liquids and the following metals: Al, Cu, brass, Mg, steel, Monel, and Sn plate. 41 references. *Battelle Technical Review* 1, Nos. 11-12, November-December, 1952, 796a. Chemical Engineering is published by McGraw-Hill Publ. Co. Inc., 330 West 42nd. Street, New York 18, New York.

* CHARACTERISTICS OF ZINC PLATES FOR LITHOGRAPHY. A. G. Arend. *Ind. Chem.* 27, 1951, pages 456-463. Factors which affect the speed and smoothness of etching are the cadmium and lead content of the zinc and also the amounts of cadmium and lead carried into the acid bath. The relative speed of etching is less influenced by variations in the characteristics of the metal than by the conditions under which the etching process is carried out. *Photographic Abstracts* 33, Part 2, No. 130, 1953, page 120. Industrial Chemist and Chemical Manufacturer is published at 33 Tothill Street, Westminster, London, S. W. 1, England.

*PRINTING SURFACES. *British Patent 648,897.* Gevaert Photo-Producten N. V. *Abridgment of Specifications* XVI, 1953, page 100. Planographic printing-surfaces are obtained by treating a hydrophilic colloid layer mounted on a base with a reducing agent, before or after transferring an inked impression to it, to render the surface lipophilic

(grease receptive), and after the surface receives the inked impression, it is treated with a lithographic etching solution which may take the form of a solution of gum arabic and the higher valency salt of a metal which has more than one valency, e.g. Cu, Ni, Co, Cr. Examples:—water 100 ml., gum arabic 25 grams, $CuCl_2$ 2 grams. The etching fluid renders the nonprinting parts of the surface hydrophilic again. The colloid may be gelatine, casein, polyvinyl compounds, polyacryl compounds, polyamides, hydrolysed cellulose esters. Fillers such as silicates, chalk, insoluble sulphates or metal oxides may be added. The reducing agent may be organic compounds as pyrogallol, or pyrocatechol, or inorganic agents, e.g. sodium thiosulphate or sulphite, together with polyhydric alcohols with or without aldehyde, or ketone groups, e.g. glycerol, glucose, etc. A hardening agent may be added to the reducing mixture. Suitable agents are formaldehyde for gelatine, etc., and salts of zirconium or borax for polyvinyl compounds. The impression may be produced by hand or mechanically, as by a typewriter and ink ribbon, or photographically.

CORROSION OF ALUMINUM BY CARBON TETRACHLORIDE. Milton Stern and Herbert H. Uhlig. *Journal of the Electrochemical Society* 99, October, 1952, pages 381-88 (8 pages). Deals with quantitative effects of moisture, dissolved gases, and impurities of CCl_4, and effects of impurities and alloying constituents in aluminum. It serves as a basis for better understanding of the mechanism of reaction of aluminum with chlorinated organic solvents. Diagrams, graphs, and tables. 14 references. *Battelle Technical Review*, 1, Nos. 11-12, November-December, 1952, page 796a.

* FLUX FOR ALUMINUM SOLDERING. *U. S. Patent 2,640,793.* Richard L. Doerr. *Chemical Abstracts* 47, No. 16, August 25, 1953, Column 7999. The flux, composed of 50-90% $SnCl_2$, 5-30% Zn dihydrazinium chloride, and 5-30% hydrazine monohydrohalide, removes Al oxides and facilitates bonding of Al with Sn-Pb, Cd-Zn, or Zn-Sn solders.

* MEASURING SURFACE ROUGHNESS. *Canadian Metals* 16, October, 1953, pages 66-67. Describes electronic roughness tester, particularly suitable for workshop, which can be used for the above against chosen standards. Table and diagram. *Battelle Technical Review* 3, No. 1, January, 1954, page 32a. Canadian Metals is published by Westman Publications, Ltd., 137 Wellington Street, West, Toronto, Ontario, Canada.

* METHOD AND SOLUTION FOR TREATING ZINC SURFACES TO INHIBIT FORMATION OF WHITE RUST. *U. S. Patent 2,665,232.* Richard A. Neish. *Official Gazette* 678, No. 1, January 5, 1954, page 245. 1. In a method of retarding the formation of white rust on zinc surfaces, the steps including applying to the surfaces a dilute aqueous solution of an alkali-metal salt of chromic acid and sodium silicate, and drying the applied solution to form a microscopic film on said surfaces. 4. A solution for the treatment of zinc-surfaced articles to retard the formation of white rust thereon consisting essentially of from 10 to 40 ml. of about 40° Bé waterglass per liter of solution, from .1 to 1% of an alkali-metal salt of chromic acid and the balance water.

POLYMETALLIC

* COPPER PLATING ON ALUMINUM OR ITS ALLOYS. *Japanese Patent 3864.* Yataro Hara. *Chemical Abstracts* 47, No. 17, September 10, 1953, Column 8561. The surface of aluminum or its alloy is cleaned by electrolysis, washed with water, immersed for 1-3 minutes at 100° in 1-5% tannic acid to give gold coloration, and washed with water. The metal as a cathode and Cu anode is electrolyzed in an electrolyte containing 15-25% $CuSO_4$ and 0.5-1.0% H_2SO_4 for 10-40 minutes at 15-20°, 2-10

amp./sq.dm., and 1.5-2.0 v. to obtain a strongly Cu-plated product. Japanese patents may be obtained as a photoprint from the Patent Office, Washington 25, D. C.

* METHOD OF BONDING COPPER TO ALUMINUM OR ALUMINUM ALLOYS. *U. S. Patent 2,662,831.* Carl R. Culverhouse, Jr. *Official Gazette* 677, No. 3, December 15, 1953, page 785. 10. The method of firmly bonding a coating of copper directly to aluminum or aluminum alloys comprising degreasing and cleaning the aluminum to be coated, immersing the aluminum thus degreased and cleaned in an aqueous solution of an alkali zincate, thereby depositing zinc on the aluminum, and chemically replacing the zinc with copper by immersing the zinc-coated aluminum in an aqueous acid solution of copper fluoborate.

GRAINING

* DETERMINATION AND PRODUCTION OF AN OPTIMUM GRAIN ON ZINC LITHO PLATES, I. J. Albrecht and H. Göckeritz. *Graph. Woche,* No. 22, August 10, 1953, pages 467-8, 470-1; August 20, 1953, pages 486-8 (in German). The objects of the graining process are indicated. Both the LTF method and a method of measuring grain developed at the Forschungsinstitut für das graphische Gewerbe, München, were used for measuring grain depth. In the Munich method a section of the plate is cut and fastened on the microscope stage in such a way that the surface of the plate is at an angle of 10° to the optical axis. The optical section is either photographed or drawn. The equipment used and its disadvantage are discussed and for practical use the method of the Institut voor grafische Techniek in Amsterdam is adopted, in which optical comparison is made with standard photomicrographs. A method of measuring the amount of water on a zinc plate on the machine has been developed. Steel balls are recommended for graining. The effect of abrasive, water, speed and stroke of machine, graining time and plate hardness is discussed, much of the information being taken from the LTF publication on graining. *Printing Abstracts* 8, No. 10, October, 1953, page 530. Graphische Woche is published by Schlütersche Verlagsanstalt und Buchdruckerei, Hanover, Gr. Wallstrasse 2, Germany.

DRY OFFSET PLATES

PLATES AND OTHER CONSIDERATIONS IN DRY OFFSET. *Modern Lithography* 21, No. 10, October, 1953, pages 53-4 (2 pages). This article answers questions raised from two previous articles on dry offset. In essence, plates should be etched .008". A 5% dot (.002") can be held conveniently. A squeeze of .001 to .006" will not damage the plate surface in any way. Makeready, especially in large sizes, and high quality work is difficult.

DRY RELIEF OFFSET ON THE MARCH. Bernard Sears. *Canadian Printer and Publisher* 62, No. 11, November, 1953, pages 37-38 and 46. Dry relief offset has proven advantageous in certain special fields of printing. One of its most important improvements is the fast method of etching of magnesium plates which take millions of impressions without breaking down. *Battelle Technical Review* 3, No. 2, February, 1954, page 96a.

GENERAL

* PAPER, INK AND PRINTING. W. Kasperowicz. *Przegl. Pap.*, 8, 9, 1952, pages 247-50 in Czech; French translation available as G1/96 (see below). The effect of thickness of paper, oil absorption, smoothness of paper surface and temperature on ink drying, and the effect of R.H. on the dimensional stability of paper are briefly discussed. A table shows the relative extent to which the "drying" of inks is due, respectively, to penetration and to hardening (oxidation) in the case of news, book and offset inks, inks for coated art and foil inks. *Printing Abstracts* 8, No. 5, May, 1953, page 207. The translation may be obtained from the publishers of Printing Abstracts: Printing, Packaging and Allied Trades Research Association, Randalls Road, Leatherhead, Surrey, England.

CONTROL INSTRUMENTS FOR OFFSET LITHOGRAPHY. IV. Henry R. Long. *National Lithographer* 61, No. 1, January, 1954, pages 26-36 (11 pages, including a digest of 8 pages). Instruments for measuring paper and ink properties are briefly described.

* THE PHYSICAL RELATIONSHIP BETWEEN PAPER AND INK. I. Olsson and L. Pihl. *Ibid.*, pages 11-15; discussion, 15-16. Some of the results of studies at the Swedish Graphic Arts Research Laboratory, Stockholm, are summarized, in which the influence of different variables (printing pressure, viscosity of ink, printing speed, roughness of cylinder surface and cylinder diameter, mechanical conditions in the printing press, etc.) on ink transfer were investigated. 4 tables, 6 figures, and 4 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 733.

PAPER — GENERAL

* PAPER WITH IMPROVED PRINTING CHARACTERISTICS. *U.S. Pat. 2,641,557.* Barrett K. Green. *Official Gazette* 671, No. 2, June 9, 1953, page 536. 1. Printing paper including as adsorptive ink bleed resistant print-receiving material particles of solid material the major portion of which are particles of attapulgite in its needle-shaped crystalline form and in its adsorptive condition. 3. The printing paper of claim 1 in which the attapulgite is applied as a constituent of a print-receiving paper surface coating.

* PAPER WITH IMPROVED PRINTING CHARACTERISTICS. *U. S. 2,641,-557.* Barrett K. Green. *Chemical Abstracts* 47, No. 15, August 5, 1953, Column 7779. Paper is impregnated or coated with needle-shaped crystals of attapulgite. Thus, a dispersion of 1 part attapulgite in 3 parts water is mixed with 1 part starch solution prepared by cooking 20% paper-coating starch in water at 200° F. for 15 minutes and allowing to cool. The resultant mixture is applied to the paper at room temperature and dried. The coated surfaces may be calendered if desired. A coating of 0.0005 inch is sufficient. Paper thus prepared is resistant to the bleeding of ink.

PAPER AND THE PRINTER. III. TRIMMING AND STORAGE. A. J. Alderson. *Paper and Print* 26, No. 1, Spring, 1953, pages 26-8, 30, 32, 34 and 38 (7 pages). The importance of perfectly square paper, the responsibility for guillotine trimming of the paper stock by either papermaker or printer, paper of uniform weight and caliper, correct moisture content, and correct storage and handling at the printer's plant are discussed, with frequent reference to good and bad practices. 5 illustrations. *Bulletin of the Institute of Paper Chemistry* 23, No. 10, June, 1953, page 746.

* AIR CONDITIONING IN THE PAPER INDUSTRY. A. E. Williams. *World's Paper Trade Review* 139, No. 18, April 30, 1953, pages 1351-2, 1354 and 1359 (4 pages). Since the humidity conditions of different types of paper vary over a wide range, each case of air conditioning in the paper-converting in-

dustry must be designed individually to meet the different requirements. The plant has to be capable of maintaining uniform temperature and relative humidity throughout the working rooms with a high degree of accuracy in the control of the ever-changing conditions. Various types of equipment are discussed, including automatic control by compressed air or water pressure and by electricity, and the use of activated alumina for air drying. 3 figures. *Bulletin of the Institute of Paper Chemistry* 23, No. 10, June, 1953, page 703. World's Paper Trade Review is published by Stonhill and Gillis, Ltd., 329 High Holborn, London, W. C. 1, England.

*PROVIDING THE RIGHT PAPER FOR THE PROCESS. John Arnold. *Paper Market*, September, 1953, pages 68-9, 72. The benefits of exchange of knowledge between papermakers and users (printers or converters) are emphasized. The importance of fitness of paper for special uses with regard to selection of specialized papers, color, surface (finish) and its uniformity, and choice of type faces is discussed. *Bulletin of the Institute of Paper Chemistry* 24, No. 3, November, 1953, page 222.

*PAPER AS A VISCO ELASTIC BODY. IX. STUDIES ON THE PLASTIC FLOW OF PAPER. J. Kubat. *Svensk Papperstidn.* 56, 17, Sept. 15, 1953, pp. 670-5 (in German; English and Swedish summaries). The relaxation of stress in paper at constant deformation was studied with the aid of a relaxation formula previously published by the author. According to this formula, the time derivative of the stress, i.e., the rate of stress decay, is an exponential function of stress. It was observed that for approximately the first 50% of the total stress decay, the stress relaxation in paper can be described with one parameter only. The dependence of this parameter on the deformation of the sample, the form of the stress-strain curve, the frozen-in stresses, the anisotropy of the sheet, and its dependence on the presence of various chemical substances in paper were investigated. The parameter depends to a great extent on the deformation only, and is independent of the rate of deformation, assuming that no stress hardening occurs during the deformation process. The influence of water vapor on the relaxation time and on the equilibrium stress is shown. 5 tables, 5 figures, and 5 references. *Bulletin of the Institute of Paper Chemistry* 24, 3, November, 1953, p. 211. Svensk Papperstidn. is published by S. Blasieholmshamnen 4A, Stockholm, Sweden.

PAPER AND THE PRINTER; PRINTERS' STORAGE. A. J. Alderson. *Paper and Print* 26, 3, Autumn, 1953, pp. 282, 284, 286 and 288. Problems associated with the storing of paper are discussed; the problem considered most important is that of ease of handling. For most efficient handling of flat sheet papers, the author suggests the use of the most suitable resting bases (floor boards, stillages, or pallets), individual stacks for each quality and size of papers, nonremoval of wrappers and marking with the size and substance of the paper, and racks for small sizes and quantities. Storage of paper in reel or web form is also discussed briefly. 4 illustrations. *Bulletin of the Institute of Paper Chemistry* 24, 3, November, 1953, p. 217.

*THE CAUSES AND CURES OF MOTTLING. *Indian Print & Paper* 19, No. 2, October 1953, page 40; No. 3, January, 1954, page 39; *Bulletin of the Institute of Paper Chemistry* 24, No. 8, April, 1954, page 649. A printed film of ink which lacks uniform appearance (mottling) may be the result of defects in the ink, paper, or equipment. Various types of mottle are described and traced to the possible cause. Indian Print & Paper is published at Chartered Bank Buildings, Calcutta 1, India.

PRINTING STUDIES AT THE SWEDISH GRAPHIC ARTS RESEARCH LABORATORY, STOCKHOLM, SWEDEN. I. Olsson and L. Pihl.

TAPPI 37, *1*, January, 1954, pp. 42-46 (5 pages). For studying the printability of paper, investigations of ink transfer between surfaces of the same or different kind have been done at the Graphic Arts Research Laboratory in Sweden. The investigations have shown that an increased printing pressure increases the ink transfer and an increased printing speed and ink viscosity decrease the ink transfer. Other variables influencing the ink transfer are the amount of ink on the printing surface, the roughness and the elasticity of the printed surface, and the diameter of the printing cylinders. The results are of importance for paper testing and for the developing of better printing papers.

THE HANDLING AND STORAGE OF PAPER. W. Keith Gainer. *National Lithographer* 61, No. 2, February, 1954, pages 34-35 (2 pages). Suggestions are made as to specifications for paper (sheet size, grain direction, basis weight, caliper, color, moisture content, and shipping containers), care of paper in the pressroom and storage, and conditioning.

* THE STRUCTURE OF PAPER AND THE PRINTED RESULT. K. E. C. Buyn. *Offset* 8, No. 20, October 3, 1953, pages 306-7; No. 21, October 17, 1953, pages 324-5; No. 22, October 31, 1953, pages 342-3, 350 (in Dutch). The structure of paper is briefly described and measurements are given of the width of fibres in different types of paper, the width of various kinds of type and half-tone dots. It is then explained, and illustrated by means of microphotographs, how much the half-tone dots can be distorted by the fibres in the surface of the paper which force the ink to one side. The question of the moisture content of the paper, the "adhesive" power of the ink, fillers and porosity are discussed. How the printing process is affected by the size of the pores is explained with reference to rotogravure printing. Subjects also dealt with are the bonding of the paper, the consistency of the ink, the adhesion between various inks and coated papers and the effect a plastic coated paper has on ink. *Printing Abstracts* 9, No. 1, January, 1954, page 73. Offset is published at Weteringschans 86, Amsterdam C., Holland.

LITHOGRAPHY AND THE PAPERMAKER. Robert K. Newcomb. *TAPPI* 37, No. 4, April 1954, pages 159-161A (3 pages). The sheet-offset process and troubles caused by the paper, dimensional instability in particular, are discussed. The possibilities of web-offset printing are pointed out; it is four times as fast as sheet-fed work, and a much wider variety of paper can be used—from newspapers through business forms and labels and checks to the finest type of multicolor printing. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, pages 738-9.

PAPER COATING

* QUALITATIVE AND QUANTITATIVE DETERMINATION OF DRYING METALS IN DRIERS AND SURFACE COATING MATERIALS. Nuodex, Ltd. 1952. 35 pages. *Rev. curr. Lit. Paint Color, Varnish*, 26, 1951, January-February, 1953, page 38 Qualitative tests for the commonly occurring drier metals are described. These are largely classical tests, but a few spot tests are included. Interfering materials are not always provided for. The quantitative methods are based on classical methods, but require a startling quantity of 200 grams of oil or varnish. The metals are acid-extracted, but no verification of this technique is given. *Printing Abstracts* 8, No. 6, June, 1953, page 271. The Review is published at Paint Research Station, Waldegrave Road, Teddington, Middlesex, England.

NEW DEVELOPMENTS IN PAPER COATING PIGMENTS. R. W. Hagemeyer. *Paper Industry* 35, No. 7, October, 1953, pages 783-4 (2 pages). Progressive refinement in paper coating

pigments in general, and calcium carbonate in particular, has resulted in better uniformity, brightness, smoothness, opacity, ink-receptivity, and color of coated paper.

OPERATING FACTORS IN OFFSET PRINTING ON COATED PAPERS. R. F. Reed and G. Wheeler. *TAPPI* 36, No. 10, October, 1953, pages 137A-140A (4 pages). A brief review of some of the problems and pitfalls in offset printing on coated papers that relate to the printing process rather than the paper. Coated papers require a higher precision and more perfect functioning of the press than uncoated papers. Improved printing plates that require a minimum of dampening are a great help in avoiding printing defects, in preventing curl and dimensional changes in paper, and in promoting the proper drying of inks.

COATED PAPER AND OFFSET LITHOGRAPHY. Part I. A. Reynolds. *TAPPI* 36, No. 10, October, 1953, pages 130A-131A (2 pages). The problems encountered twenty years ago in attempting to lithograph on coated papers are discussed and the improvements that have taken place since then described. Inks, fountain solutions, blankets, plate grain, halftone camera work, and press adjustments have all been improved.

*DETERMINING GLOSS ON PRINTED PACKAGES. J. Bertram Bates. *American Boxmaker* 42, *11*, November, 1953, pp. 15-16; *Paper, Film and Foil Converter* 27, *12*, December, 1953, pp. 21-2. Results of tests made by the gloss committee of Packaging Institute, Inc. on several glossmeters (one 60° Photovolt and three 75° Photovolt instruments) to determine gloss on specimens of a good commercial grade of C1S label red stock in six gloss steps are reported. 4 tables. *Bulletin of Institute of Paper Chemistry* 24, 4, Demember, 1953, p. 303. American Boxmaker is published by Howard Publishing Company, 111 W. Washington, Chicago 2, Ill.

PAPER PROPERTIES

PAPER CHARACTERISTICS FOR GOOD PRINTING. Morris S. Kantrowitz. *Share Your Knowledge Review* 34, No. 8, May 1953, pages 13-14 (2 pages). The author describes the following paper characteristics which he considers most important from the printing standpoint: smoothness, ink receptivity, porosity, surface strength, opacity, closed formation, uniform thickness, uniform color, resistance to flaking and dusting, absence of abrasive particles, and a good general appearance. *Bulletin of the Institute of Paper Chemistry* 23, No. 10, June, 1953, page 741.

OIL ABSORBABILITY AND PRINTABILITY OF PAPER. Masaru Kakehashi and Shusaki Ika. *Research Bull. Govt. Print. Bur.* Tokyo, Japan No. 1, June, 1953, 20 pp. (in English). The authors describe a photoelectric oil absorption meter similar to the apparatus of Vallandigham. A drop of oil or other test liquid is spread over the surface of the paper specimen and the change in specular gloss of the oiled surface is observed. The degrees of oil absorption (time for gloss to fall to specified value) by a coated paper, a map paper, three uncoated printing papers, and a newsprint were determined by this apparatus using raw linseed oil, a 1:3 mixture of raw linseed oil and castor oil, two ink varnishes, and a news ink vehicle. The results of the tests with the linseed oil-castor oil mixture are compared with the results of the castor oil drop test. The variability of the test was studied and found to be small. Under fixed experimental conditions it is found that the amount of oil which is spread over the paper surface from an initial drop of constant size is independent of the paper surface. The logarithm of the degree of oil absorption is found to be proportional to the temperature of test. The degrees of oil absorption in handsheets made of groundwood, bleached linen, groundwood-sulfite, bleached sulfite, and mitsumata were observed and found to increase in the order named. The degree

of oil absorption was found to increase with the amount of clay loading, with beating of the pulp, and with smoothness of the sheets. Additions of rosin size and melamine resin to the furnish had little effect on oil absorption. It is stated that oil absorbability is related to printability. 17 tables, 6 figures, and 15 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 6, February, 1954, page 470.

* THE PRINTABILITY OF PAPERS. *Allgem. Papier-Rundschau* No. 2, January 26, 1953, pages 58-9, (in German). This is a summary of two Dutch papers by J. F. Monroy and F. J. M. Wijnekus of the Instituut voor Grafische Techniek in Amsterdam, in which the I.G.T. printing tester (I) and an auxiliary instrument for the automatic inking of the form are discussed. The use of (I) for determining pick resistance, the covering power of standard printing ink, the drying time of different inks, and the smoothness of paper are described. 3 illustrations. *Bulletin of the Institute of Paper Chemistry* 24, No. 6, February, 1954, page 470. Allgemeine Papier-Rundschau is published at Frankfurt a. Main 4, Fürstenbergerstr. 175, Germany.

*TWO SIDEDNESS OF PAPER. Keshab D. Bhargava. *Indian Pulp and Paper* 7, No. 11, May, 1953, pages 525-6. The causes of structural and color two-sidedness of paper and possible remedies are discussed. *Bulletin of the Institute of Paper Chemistry* 23, No. 12, August, 1953, page 898. The Indian Pulp and Paper is published at 1-A, Vansittart Row, Calcutta 1, India.

* THE PRINTABILITY OF PAPER (INTRODUCTION). Gösta E. Carlsson. *Ibid.*, pages 4-6; discussion, 6. Printability (I) of paper was selected as the subject for discussion at the Second International Conference held in Stockholm, Sweden on June 8-13, 1953. As an introduction to the discussion, the author attempts to give a definition of the term, showing that it comprises all the properties of the paper in the printing machine and the qualitative and quantitative printing result, in other words, (I) stands for the suitability of paper as a raw material for the printing process. It is therefore impossible to establish any general standards or demands for the (I) of paper; the demands have to be changed according to the printing condition. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 738.

THE RELATION OF PAPER AND MOISTURE. W. H. Bureau. *Printing Equipment Engineer* 83, No. 10, July, 1953, pages 27-28 (2 pages). This is a continuation of the previous article in which the importance of grain direction, cause of static electricity, the influence of moisture on curl and physical properties, and ordering paper for conditioned plants are also covered.

PAPER PROPERTIES AS RELATED TO PRINTABILITY. Part I. William H. Bureau. *Printing Equipment Engineer* 83, No. 12, September, 1953, pages 66-7 and 73 (3 pages). Ink receptivity is determined by the capillarity or interfiber spaces in uncoated paper. The effects of calendering, sizing and fillers on ink receptivity are discussed. Ink receptivity of coated paper is determined by coating characteristics. Amount of adhesive, type of pigment, and calendering affect these characteristics.

THE IMPORTANCE OF PAPER ABSORPTION IN PRINTING. Frederick T. Day. *Paper and Print* 26, 3, Autumn, 1953, pp. 330 and 332 (2 pages). The influence of the absorptive properties of paper on its behavior during printing and conversion is described, and the importance of proper atmospheric conditions during these operations is stressed. Useful directions for satisfactory paper storage are given. The fact is mentioned that china clay used in coating is much less

influenced by moisture variation than the fibrous finish and will assist in counteracting faults of paper contraction and expansion to a certain extent. *Bulletin of the Institute of Paper Chemistry* 24, 3, November, 1953, p. 217.

PAPER PROPERTIES AS RELATED TO PRINTABILITY. II. William H. Bureau. *Printing Equipment Engineer* 84, No. 1, October, 1953, pages 39 and 67 (2 pages). Compressibility, resiliency, how they are attained or reduced in paper making, and their influence on printability are discussed.

PAPER PROPERTIES AS RELATED TO PRINTABILITY. III. William H. Bureau. *Printing Equipment Engineer* 84, No. 4, January, 1954, pages 30-32 (3 pages). Smoothness, as distinguished from gloss, refers to the actual paper surface contour. The influence of paper making raw materials, paper machine operation, and coatings on smoothness is discussed. The importance of smoothness for letterpress, rotogravure, and offset lithography is determined by the fineness of screen used since the rougher the surface, the poorer the contact between ink and paper.

IBID., IV. OPACITY. William H. Bureau. *Printing Equipment Engineer* 84, No. 5, February, 1954, pages 46-48 (3 pages). Opacity, the ability of paper to stop light transmission, is becoming of greater importance because of the trend towards lighter basic weight papers. The physics of opacity, why papers differ in this property, and how it is measured are discussed.

*A REVIEW OF PRINTABILITY WORK. S. R. C. Poulter. *Intern. Bull. for the Printing and Allied Trades* 67, January, 1954, pages 6-10. A review is presented which covers the means of forecasting printability and the task of objectively assessing the quality of a print under the headings: physical tests, work with proofing press, simplified printing methods, special "printing" apparatus for printability testing, and print quality. 70 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 734. The International Bulletin for the Printing and Allied Trades is published at 69 New Oxford Street, London, W. C. 1, England.

PAPER PROPERTIES AS RELATED TO PRINTABILITY V. BRIGHTNESS William H. Bureau. *Printing Equipment Engineer* 84, No. 6, March, 1954, pages 72 and 74 (2 pages). Brightness is defined and its importance in paper is discussed. The use of dyes to improve on pulp color and pigments to improve brightness and opacity is covered. Factors affecting brightness of coated and white lined papers are pigments, sizing, raw stock, and calendering. Brightness is important in obtaining contrast in the printed product although the paper is generally chosen from unprinted samples.

*THE PRINTABILITY OF PAPER *Caractère* 4, No. 12, December, 1953, pages 1451, 1453, 1455–7, 1461, 1463, 1465 (in French); *Printing Abstracts* 9, No. 4, April, 1954, page 246. The factors which affect printability are outlined, and the I.G.T. printability testing machine, which can be used for experiments on picking resistance, ink penetration and drying, opacity of the ink film, etc., is described. Caractère is published at Cie Francaise d'Editions, 40 Rue du Colisée, Paris (8e).

DIMENSIONAL INSTABILITY: CONSTANT VARIABLE IN BOXBOARD MANUFACTURING. Joseph J. Schwinkler. *TAPPI* 37, No. 4, April, 1954, pages 168A-170A (3 pages). Dimensional stability problems are rarely encountered in boxboard manufacture. When dimensional changes occur, troubles from curl and wavy edges are encountered.

PAPER PROPERTIES AS RELATED TO PRINTABILITY. VI. SURFACE BONDING STRENGTH. W. H. Bureau.

Printing Equipment Engineer 84, No. 8, May, 1954, pages 40, and 64-65 (3 pages). This installment covers pick strength of coated and uncoated papers, the ink paper relationship, the nature of picking, the factors important in picking, and the measurement of pick strength.

PAPER PROPERTIES AS RELATED TO PRINTABILITY. VII. CHEMICAL CONSIDERATIONS. W. H. Bureau. *Printing Equipment Engineer* 84, No. 9, June, 1954, pages 92 and 127-128 (3 pages). The measurement and significance to the printer of paper pH is discussed.

* INFLUENCE OF STRENGTH AND MECHANICAL PROPERTIES ON PRINTABILITY. Börje Steenberg. *Ibid.*, pages 35-7; discussion, 37-8. To understand the behavior of paper in the printing press, it is essential to know the complete stress-strain relationships; the classical paper-testing figures do not give information regarding the extent of deformations to which the paper is subjected in a press. The author reviews the present state of knowledge of the visco-elastic properties of paper and the extent to which they can be measured; apparently no instrument is yet on the market which will analyze the properties of ordinary printing papers under compression in a way similar to that occurring in a printing press. The importance of the visco-elastic properties of paper to the printer is illustrated with reference to problems of cockling and dimensional instability, and the need for further knowledge is emphasized. The need for additional information on the surface-strength properties of paper is also stressed, and the dusting problem in the printing industry is used as an example. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 734.

PAPER TROUBLES

HOW TO CONDITION PAPER. Louis Pollner. *Graphic Arts Monthly* 25, No. 9, September, 1953, pages 66, 68, 70, 72, 74 and 78 (6 pages). The methods available for paper conditioning and the merits and limitations of conventional conditioners are discussed. Because most mills produce paper at less than 45% relative humidity, storage at 5-8% above pressroom humidity (the optimum) invites moisture penetration into the pile edges causing damage. Some type of conditioner in which moisture can be added is therefore necessary. Humidifiers, including compressed air atomizer, motor-driven rotor sprays, evaporative humidifiers, and steam humidifiers, are described. The limit of moisture addition appears to be about 5% in paper humidity because of curl difficulties.

PAPER DISTORTION. *Fuchs and Lang Litho Letter*, July-August, 1953, 3 pages. To reduce fanning out, the stops can be shimmed to give the sheet a concave edge in the grippers. With three-point register presses the center of the back edge should be raised when the grippers close.

PAPER WRINKLING. *Fuchs and Lang Litho Letter*, July-August, 1953, 2 pages. (When ordered with preceding article, the charge will be for four pages.) To avoid paper wrinkling it should be protected by wrapping until used. Makeready sheets will indicate what may be expected. When sheets wave along the edges, electric heaters placed around the stock in the feeder may help. If they bulge in the center, apply the heat over the center of the stock or below the feeder tapes.

CAUSE AND CORRECTION OF DIFFICULTIES WITH OFFSET PAPERS. William Beckett. *National Lithographer* 61, No. 1, January, 1954, pages 40-42 (3 pages). The properties of paper which cause it to change size with R.H. are described and methods of controlling size changes are suggested. Other causes for misregister are unevenly set grippers, creepy blankets, distorted plates, and poor paper trimming.

* PROCESS AND APPARATUS FOR AVOIDING CURL IN MACHINE-MADE PAPER. *U. S. Patent 2,661,669.* Valentine Friedrich, Jr. *Bulletin of the Institute of Paper Chemistry* 24, No. 6, February, 1954, page 510. Objectionable curling of paper, especially that used for color lithography, is eliminated by the introduction of minute quantities of water into the felt side just prior to calendering. Passing the web over a chilling roll at the same time that a moist felt engages the felt side supplies sufficient water to relax the fibers and eliminate the curl. 3 figures.

* GLOSS MEASUREMENT OF HIGH GLOSS PAPERS. V. G. W. Harrison and S. R. C. Poulter. *Research* 7, No. 4, April, 1954, pages 128-36. A physical and psychological study was made of the gloss of a series of high-gloss, machine-glazed papers which differed widely in color. Much disagreement was found between different observers, and marked changes in ranking occurred when the viewing conditions were changed. Gloss is considered a psychological quantity and, consequently, it is not possible to establish a gloss scale which will be satisfactory to all observers under all conditions of viewing. However, an empirical formula was constructed and tested which relates instrument measurements to the average judgment of gloss of many observers who view the paper under diffuse or single-lamp illumination such that recognizable mirror images are not formed. 14 tables, 6 figures, and 7 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, pages 732-3. Research is published by Interscience Publishers, Inc., 250 Fifth Avnue, New York 1, N. Y.

PAPER TESTING

* TESTS AND PROPERTIES OF PRINTING PAPERS. K. Palenik and A. Winczakiewicz. *Przegl. Pap.*, 8, 9, 1952, pages 237-46 (in Czech; French translation available as G1/97). The properties required in papers for printing by the letterpress, offset-litho and photogravure processes are briefly discussed, as are the following: paper tests and their significance for printing papers or tearing strength, extensibility, thickness, machine direction, moisture content, fibre finish, copper number, acidity, sizing, chloride and sulphur contents, surface finish, surface bonding strength, smoothness and porosity, transparency, colour and oil absorption. *Printing Abstracts* 8, No. 5, May, 1953, page 213. The French translation may be obtained as in the preceding abstract.

DETERMINATION OF THE TENDENCY OF PAPER TO FLUFF (in Dutch). G. Blokhuis. *I. G. T. Nieuws* 6, 5, 1953, pp. 78-81 (4 pages). The Instituut voor Grafische Techniek has developed a device for measuring the fluffing tendency of paper. At a given humidity a strip of paper is put on the apparatus consisting of 6 rotating cylinders and the fluff is caught on a piece of glass and the amount can be compraed to the amount caught from other types of paper. *Printing Abstracts* 8, 9, September, 1953, p. 435.

A STUDY OF THE I.P.C. SURFACE BONDING STRENGTH TESTER. Progress Report Eight by the Institute of Paper Chemistry. *Technical Report No. 15, American Newspaper Publishers Association.* (12 pages). This is a progress report in which mechanical improvements and the effects of contaminants on the paper surface, specimen backing, load on the film-carrying wheel, and film thickness of the viscous liquid are described. A study of the effects of temperature and aging was also made.

A STUDY OF THE I.P.C. SURFACE BONDING STRENGTH TESTER. PROGRESS REPORT EIGHT BY THE INSTITUTE OF PAPER CHEMISTRY. W. A. Wink and J. A. van den Akker. *American Newspaper Publishers' Association Technical Report No. 15,* August 13, 1953, 12 pages. A study of

the new rotary-type I.P.C. surface-bonding strength tester and instrumental and procedural modifications which have been made since the construction of this instrument are discussed, and data are given which show the influence of a number of variables on the instrumental results. The instrumental and procedural modifications include (a) the design and construction of an improved doctoring tool for forming the film of viscous fluid on the film-carrying wheel; (b) the conversion of one of the film-carrying wheels to a "driver" to avoid slippage between the sample and film-carrying wheels; (c) the installation of a mechanism for automatically lifting the film-carrying wheel from the surface of the sample so as to facilitate the inspection of the film following the test of a specimen; (d) the application of a very thin uniform film of Minnesota Mining and Manufacturing Company trim cement to the rim of the sample wheel to fortify the bond between the double-faced tape and the surface of the wheel; and (e) the construction of a rule which reads directly in centimeters/second, the velocity corresponding to the selected end-points. Of the various viscous materials investigated, the polyisobutylenes of different viscosities appear to be the most suitable for the film which produces the tension stress at the surface of the paper. The various procedural techniques and variables include the influence of contaminants, specimen backing, loading of the film-carrying wheel, and thickness of the viscous film. 2 tables, 5 figures, and 3 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 1, September, 1953, page 44.

TESTING METHODS FOR PRINTABILITY OF PAPER. PROGRESS REPORT NO. TEN. Institute of Paper Chemistry. *American Newspaper Publishers Association Technical Report* No. 17, January 7, 1954, 16 pages. This report deals primarily with a laboratory study of ink transfer to three newsprints of known relative printing quality. On the basis of behavior on the presses of a large metropolitan daily paper, one newsprint was classed as good, one as average, and one as poor in printing quality. The previously described techniques employing the inclined plane and roll apparatus were used to transfer ink to the papers from uniform ink films and by spreading drops of ink on the papers. The ink transfer data were used to calculate critical film thicknesses and ink absorptions. Data on apparent density, Gurley porosity, Thwing formation, gloss, Bekk smoothness, and Chapman smoothness are also presented. The ranking of the newsprints in order of decreasing printing quality is the same as the ranking in order of decreasing density, formation, smoothness and gloss and increasing critical film thickness and ink absorption. The better formed, denser, smoother, and less absorbent sheet is the better printing sheet. Similar tests of specimens of these papers which had suffered excursions from 50 to 75 or 90 and back to 50% relative humidity showed that the newsprints experienced irreversible decreases in density, smoothness, and gloss and increases in critical film thickness and absorbency—changes which suggest poorer printing quality.

*APPARATUS FOR THE MEASUREMENT OF SHEET FORMATION. G. F. Glover and H. F. Rance. *Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc.* 34, 2, June, 1953, pp. 247-63; discussion, pp. 264-7. An account is given of an instrumental method of measuring the formation of paper. The sample is rotated at high speed and is scanned by a light spot. The transmitted light falls on a photocell whose output fluctuates with the variations in the paper. The resulting photocurrent then has an alternating component which can be amplified and measured to give a figure corresponding to the wildness of the paper sample. 6 tables, 9 figures, and 9 references. *Bulletin of the Institute of Paper Chemistry* 24, 3, November, 1953, p. 218. The Pro-

ceedings are published at St. Winifred's, Welcomes Road, Kenley, Surrey, England.

* AN INSTRUMENT FOR THE MEASUREMENT OF DISTINCTNESS-OF-IMAGE GLOSS. W. E. Knowles Middleton and A. G. Mungall. *Canadian Journal of Technology* 31, July-August, 1953, pages 160-7. The type of gloss known as distinctness-of-image gloss, which controls the sharpness of images seen in a reflecting surface, has hitherto resisted instrumental measurement. An instrument has been developed for this purpose, essentially an automatic goniophotometer which scans rapidly over a small range of angles centered on the angle of specular reflection, and by electronic means measures the maximum slope of the goniophotometric curve. The meter readings given by this instrument correlate well with the judgments of observers who use no optical aids. The principle of the instrument is the subject of a patent application. 2 tables, 5 diagrams, and 1 reference. *Bulletin of the Institute of Paper Chemistry* 24, No. 6, February, 1954, pages 469-70. Canadian Journal of Technology is published by Administrative Services, National Research Council, Ottawa, Canada.

* AN INSTRUMENT FOR MEASURING PAPER MOISTURE. *Wochbl. Papierfabrik.* 81, No. 20, October 31, 1953, page 751 (in German). A pocket-size instrument for the rapid measurement of moisture in paper (including running webs and piles) based on its electrical conductivity is described; a similar instrument serves for the detection of static electricity in paper. Both instruments are constructed by K. P. Mundinger in Renningen, Germany. 1 illustration. *Bulletin of the Institute of Paper Chemistry* 24, No. 6, February, 1954, page 470. Wochenblatt für Papierfabrikation is published by Günter-Staib Verlag, Biberach an der Riss (Württemberg), Germany.

DEFINING THE SURFACE SMOOTHNESS OF PAPER WITH BRUSH SURFACE ANALYZER. E. J. Barber. *TAPPI* 35, No. 11, November, 1953, page 158A. An "average" or "composite" measure of surface irregularities does not give an adequate definition of smoothness. Surface irregularities can be classified into groups according to size and shape, and these groups are related to printing characteristics. In the printing nip narrow high peaks in the surface penetrate the ink film to such a depth they emerge with a very thin covering of ink. The result is a light spot in an area which should be solid colour. Similarly a deep narrow valley may be devoid of ink. Broad high peaks print satisfactorily because they do not penetrate the ink film deeply. Their breadth results in a wider distribution of the excess nip pressure. The frequency of narrow high peaks has been successfully correlated with printing quality. These conclusions are based upon measurements made with a brush surface analyzer. The brush analyzer consists of a diamond stylus or probe attached to a crystal, an amplifier, and a device which records a magnified profile of the paper surface on a moving chart. The instrument, is, therefore, similar to a phonograph record player except that the surface irregularities are translated into an expanded profile tracing instead of sound.

* NEW PAPER SURFACE TESTER. *Allg. Pap. Rdsch.* no. 19, October 5, 1953, pages 833-4 (in German). An enlarged image of surfaces to be compared, illuminated by a source positioned at an angle of 4° to them, is thrown on a glass screen. A focusing device is incorporated and the image can be visually inspected or photographed. (Karl Frank GmbH, Weinheim-Birkenau.) *Printing Abstracts* 8, No. 12, December, 1953, page 622. Allgemeine Papier-Rundschau is published at Frankfurt a. Main 4, Fürstenbergerstr. 175, Germany.

* METHOD FOR MEASURING THE PORE DIAMETER OF A PAPER. J. Pouradier and H. Chateau. *Assoc. tech. ind. papetière*, Bull. 1, 1954, pages 8-10 (in French); *Bulletin of the Institute of Paper Chemistry* 24, No. 8, April, 1954, page 647. Both dry papers (I) and swollen wetted papers (II) were studied. The method for determining the average pore diameter (III) depends on the minimum pressure (IV) required to force an air bubble through a strip of paper surmounted by an organic liquid in the case of (I), or water in the case of (II). The organic liquids must have a reasonably low surface tension (V), should not swell (I), and have a relatively low vapor pressure at room temperature. About 10 liquids proved suitable, but carbon tetrachloride was the most satisfactory. The very simple apparatus made entirely of glass used for determining (III) is described. (III) (in microns) = [3 (V) (in dynes/cm.)] /(IV) (in cm. of mercury). The results are reproducible to within ± 8-12% and serve to characterize a specific paper. Great increases in (III) were noted when a sample was moistened and swollen; these findings are discussed. 3 tables and 3 figures. Association Technique de l'Industrie Papetière Bulletin is published at 154 Boulevard Haussmann, Paris (8e), France.

THE CHAPMAN PRINTING SMOOTHNESS TESTER. PART I. BASIC DEVELOPMENT AND RECENT MODIFICATIONS. S. M. Chapman. *Pulp and Paper Magazine of Canada* 55, No. 4, March, 1954, pages 88-93 and 104 (6 pages); (not to be reproduced without permission). An instrument designed to measure printing smoothness by an optical method was disclosed in a previous report from the Pulp and Paper Research Institute of Canada. The present paper reviews the theory of the method and discusses its theoretical shortcomings. One of these is the fact that the paper surface must make optical contact with a glass surface in order to register as contact. In printing, on the other hand, the paper surface need only approach the printing form to within the thickness of the ink film. This fairly fluid film can move about under the printing pressure and flow into very small depressions in the surface. Some experiments were carried out in which attempts were made to simulate, in the test, this action of the ink film in printing. Recent modifications to the original instrument are also described. These improvements have resulted in making it direct reading and more readily standardized.

THE CHAPMAN PRINTING SMOOTHNESS TESTER. PART II. INSTRUMENT VARIABLES AND SOME RESULTS OF APPLICATION. G. R. Sears, J. A. Van den Akker, M. H. Aprison, N. J. Beckman and C. W. Denzer. *Pulp and Paper Magazine of Canada* 55, No. 4, March, 1954, pages 94-104 (11 pages); (not to be reproduced without permission). A printing smoothness tester, having an optical system which is a modification of Chapman's original arrangement, is described. The linearity of the photometric systems was found to be satisfactory. The *A'* reading for zero optical contact during the calibration procedure is ascribed to stray light originating principally at debris and surface imperfections on the bottom face of the prism. The instrument constants and the *F*-values of paper were found to be essentially independent of the voltage applied to the lamp as long as the voltage was steady during calibration and determination of each *F*-value. The use of mineral oil instead of a liquid having a refractive index more nearly matching the index of the glass prism was found to introduce an error in *F*-values of only 1 or 2%. It is shown that no serious error in relative smoothness values should result from the variability in color of "white" papers. In comparisons of highly colored papers, a red sheet would have a higher smoothness value than a green or blue sheet. The combined variabilities of papers and the instrument are as small as can be expected on the basis of the known vari-

ability of paper. The F-values of papers increase with increasing time of pressure application in the instrument. The minimum time of pressure application in the present instrument is large compared with impression times in printing. The nature of the material with which a specimen is backed when in the tester influences the observed smoothness value; softer backing leads to higher smoothness. The change in smoothness with change in backing material varies among papers. The patterns of contact areas vary greatly among papers, and it is noted that visual observations of the patterns as well as determinations of F-values are important in the comparison of papers. Particularly in the case of gravure prints there is correlation between skips in the print and non-contact areas when under pressure in the Chapman instrument. The smoothness values of a number of rubber sheets and offset press blankets were found to differ considerably at low pressures. 9 tables, 18 figures, and 3 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 736.

THE CHAPMAN PRINTING SMOOTHNESS TESTER. PART III. DESIGN AND USE OF A DIRECT READING TESTER. D. Noel Obenshain. *Pulp and Paper Magazine of Canada* 55, No. 4, pages 105-16 (12 pages); (not to be reproduced without permission). The author covers the design, construction, and use of direct reading Chapman printing smoothness tester built by the West Virginia Pulp and Paper Co. at its Luke, Md. research laboratory. Five of the instruments have been built to date for use in the company's laboratories. Considerable work has been done with the original tester. The instrument is a rugged, compact, self-contained unit which automatically indicates on an easily read dial the Chapman F-value of the sample of paper clamped therein. All controls are conveniently arranged for ease of operation. Special design features make the instrument substantially immune to damage by accidental misuse. Data presented on operation of the tester show very good correlation with printability. Included are some photographs of typical paper surfaces as viewed through the Chapman tester and the same papers as viewed through a low-powered microscope with the surfaces illuminated at a very flat angle. The calculations for a typical dial calibration and a complete list of parts for the instrument are given in the appendix. 6 tables, 26 figures, and 2 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, pages 735-6.

* MEASURING THE SMOOTHNESS AND THE SURFACE HARDNESS OF PAPER. E. E. Andersen and C. W. Christensen. *Ibid.*, pages 24-9; discussion, 30. The principles of several methods for determining smoothness of paper (Bekk, Gurley, Williams, Chapman, and Bendtsen) are described, with particular emphasis on the Bendtsen smoothness tester. A direct conversion from one method to another is not feasible; an agreement between graphic arts research laboratories and paper manufacturers to standardize on the use of one method is therefore recommended. Paper hardness depends on at least four physical properties (compressibility or resilience, rigidity, surface structure, and density). The methods adopted for determining the hardness of the paper will measure these various properties, which to some extent are interrelated and not easily measured individually; any of the properties listed may be predominant in the results. As far as paper hardness for printability is concerned, surface hardness or compressibility and surface structure are of greatest importance. Of the different testers described (Bendtsen, Bekk, Gurley-Hill, and Clark), a modification of the Bendtsen smoothness test in combination with actual smoothness data is claimed to give results which correspond to actual printing performance. For instance, the Bendtsen tester will differentiate between the top and wire side of a paper, it will give a fine differentiation between calendered and uncalendered, wood-containing and wood-free, and sized and

unsized papers. 12 figures and 14 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, pages 734-5.

* TESTING THE PRINTABILITY OF NEWSPRINT. I. Olsson and L. Pihl. *Ibid.*, pages 48-52; discussion, 52-3. The physical properties of different kinds of newsprint were measured, including smoothness, porosity, oil flotation number, basis weight, opacity, etc. At the same time different factors connected with the printing result (ink-transfer number, blackness, print-through, etc.) were determined. The quality of the prints was judged by several observers and, through calculation of the correlation coefficients, the existing relationships between the quality of the print and the properties of the paper were investigated and discussed. The results seem to indicate that among the properties investigated, only porosity, ink receptivity, and opacity of the paper influence the printing result. 6 tables, 4 figures, and 5 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 734.

* PENETRATION OF INK INTO PAPER. I. Olsson and L. Pihl, *Ibid.*, pages 19-23; discussion, 23-4. The penetration of a liquid into a sheet of paper is discussed in accordance with the law of Hagen-Poiseuille. Different methods of testing the quantities in this law are analyzed; the influence of paper sizing and surface treatment of paper on oil penetration and the absorptive properties of paper in relation to printing speed are shown in experiments. Setoff and print-through (strike-through and show-through) in relation to paper are discussed. 4 tables, 3 figures, and 8 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 733.

* THE PROBLEM OF MEASURING THE UNIFORMITY OF NEWSPRINT QUALITY BY ELECTRONIC METHODS. C. Bendtsen. *Ibid.*, page 54; discussion, 55. A multitester suitable as a production control instrument calibrated to the individual properties of a particular paper is described. The substance and caliper thickness are measured for a strip of paper which is run through the machine; the substance variations are obtained by photometrical measurement of the opacity. The caliper is measured through a loaded needle and the variations are transferred in electro-magnetic variations which are registered on the recorder strip. From the substance and caliper, the moisture content, porosity, and smoothness are calculated according to derived empirical formulas. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 733.

* DIMENSIONAL STABILITY OF PAPER AND HUMIDITY. A. Arnamo. *Ibid.*, pages 38-41; discussion 41-2. Following a discussion of the factors which influence the dimensional stability of paper, an instrument for measuring this property at varying R.H.'s constructed at the Swedish Graphic Arts Research Laboratory is described. It permits the simultaneous testing of several samples; four strips in both machine and cross-machine directions were found the optimum number. The instrument has been used for routine testing for a long time at the laboratory and has been found very reliable. 2 tables, 4 figures, and 1 reference. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 732.

INK — GENERAL

VEHICLES FOR LITHOGRAPHIC OR OFFSET INKS. *Share Your Knowledge Review* 34, No. 7, April, 1953, page 14. Vehicle materials are: 1. bodied linseed oils, 2. phenolic resins cooked in a drying oil, 3. alkyd resins cooked in drying oils. To get quick drying (setting) manufacturers are incorporating mineral oil resins and solvents.

* THE CONSUMPTION OF PRINTING INK. J. M. Brugman. *Tech. Tijdschr. graf. Ind* 8, 1, 1953, pages 20-2

(in Dutch) The estimated consumption of inks of different types on various papers is indicated. *Printing Abstracts* 8, No. 5, May, 1953, page 207. Technisch-Wetenschappelijk Tijdschrift is published at Vlaamse Ingenieursvereniging, Torengebouw VIII, Schoenmarkt 31, Antwerp, Belgium.

INKS FOR METAL DECORATING. Herbert J. Wolfe. *Modern Lithography* 21, No. 6, June, 1953, pages 85 & 87 (2 pages). The requirements for metal decorating inks are described: 1. Freedom from grease, 2. Short baking schedules, 3. Hardness, 4. Toughness, 5. Luster, and 6. Bleed resistance for wet-ink-varnishing.

A BACK ROOM VIEW FROM PATRA. W. H. Banks. *Penrose Annual* 47, 1953, pages 85-7 and 1 plate. The author discusses the phenomenon of tension in liquids and consequent cavitation and its relationship to certain printing problems, including the behavior of inks or thin litho varnishes in the nip of distributing rollers, the application of a varnish to paper by one roller, the behavior of ink and water films in the nip between inking roller and lithographic plate, ink fly or misting, and printing on nonabsorbent surfaces, such as metal foils. 3 figures. *Bulletin of the Institute of Paper Chemistry* 24, No. 1, September, 1953, page 47.

WHAT YOU SHOULD KNOW ABOUT LITHOGRAPHIC INKS. Charles W. Latham. *American Printer* 134, No. 9, September, 1953, pages 44-5, 70-3 (6 pages). The author discusses the characteristics required in lithographic inks, their composition, and the phenomena of setting because of thixotropy and by vehicle absorption and drying by oxidation and polymerization. He also covers the effects of different ink pigments, reducers, compounds, dopes, oxygen availability, and temperature on drying rate and final film characteristics.

REVERSE THIXOTROPY, A RESULT OF PIGMENT-VEHICLE INTERACTION IN BENZIDINE YELLOW DISPERSIONS. Edmund N. Harvey, Jr., Romuald Bulas and Jerome Fine, *Papers Presented at the Chicago Meeting of the Division of Paint, Plastics, and Printing Ink Chemistry*, September, 1953, pages 308-315 (8 pages); 1 figure, page 316. Summary and conclusions: 1. A rheological phenomen termed "reverse thixotropy" has been observed in certain textile printing inks; 2. Its basic attribute as defined by flow curves obtained with a rotational viscometer is an increase in yield value on continued shearing in the viscometer; 3. The effect is most marked in flushed dispersions of benzidine yellow with added resinous ingredients; 4. Quantitative differences in the effect as influenced by formulation variables are described and discussed; 5. Apparently rather closely related to thixotropy, and resembling rheoplexy in certain respects, the phenomenon of reverse thixotropy probably stems from changes in the state of flocculation of pigment particles. Conjectural explanations for the phenomenon are advanced.

THE ELECTRICAL APPROACH TO PARTICLE FLOCCULATION IN CONCENTRATED NONAQUEOUS DISPERSIONS. Andries Voet. *Ibid.*, pages 297-305 (9 pages); 3 figures, pages 306-7 (2 pages). The influence of particle size and shape, difference in dielectric constant between pigment and vehicle, pigment conductivity, particle orientation, measurement frequency, etc., on measuring particle flocculation in nonaqueous dispersions electrically and the limitations of these methods are discussed.

RESIDUAL VISCOSITY OF PAINT SYSTEMS AT INFINITE SHEAR VELOCITY. W. K. Asbeck and M. Van Loo. *Ibid.*, pages 279-291 (13 pages); 9 figures, pages 292-6 (5 pages). Briefly discussed are the Band Viscometer, Self-Centering Rotational Viscometer, structure at low shear velocities and infinite shear velocity. The design for an

apparatus to measure directly the true viscosity of a system at a given shear velocity is given. The viscosity at infinite shear velocity ($\eta\infty$) for solid-liquid systems in which little structure is present in the liquid can be found by extrapolating $1/\sqrt{D}$ to 0 for $\eta^* = \eta\infty e^{s/\sqrt{D}}$ where:

η^* = apparent measured viscosity
D = shear velocity
$\eta\infty$ is independent of structure and therefore is the system viscosity in the Vand equation.

THE CARE AND STORAGE OF OFFSET INKS. R. S. Shepherd. *National Lithographer* 61, No. 2, February, 1954, page 29. Recommendations are made regarding proper care of offset inks, namely. 1. buy inks without driers if they are to be stored, 2. consult ink maker regarding amount and type of driers to be added, 3. keep inks away from excessive heat or cold, 4. do not return inks from fountains to cans for future use, and 5. always smooth down surface of any ink remaining in cans and cover with waxed or oiled paper, before storing.

INK PLANT OBSERVER. I. M. Bernstein. *American Ink Maker* 32, No. 2, February, 1954, pages 51, 63 and 65 (3 pages). The use of ultrasonics for pigment dispersion in inks is discussed. Apparently the major limitation is the low power intensities available as compared to conventional three roll mills.

INK TESTING

* QUALITATIVE VEHICLE TESTS. *Official Digest of the Federation of Paint and Varnish Production Clubs* No. 334, 1952, pages 731-5 (5 pages). Detailed instructions are given for performing the following tests: Soda-lime tests for urea-formaldehyde or melamine-formaldehyde resins; Beilstein's test for halogenated resins, the sublimation test as applied to alkyds; the diphenylamine-sulphuric spot test for nitrocellulose; saponification number tests for newer resin vehicles; the zinc dust-sodium hydroxite test for polymerization catalysts in linseed oil; quick specific qualitative tests for determination of characteristic components in vehicles or synthetic resins. *Printing Abstracts* 8, No. 6, June, 1953, page 271. The Official Digest is published by the Federation of Paint & Varnish Production Clubs, 121 South Broad St., Philadelphia 7, Pennsylvania.

* DRIER TECHNOLOGY DEVELOPMENTS. Charles Gardner. *Paint and Varnish Production* 43, No. 6, 1953, pages 38-76. The introduction of calcium naphthenate as a replacement for lead in alkyds and phenolic varnishes, and as a haze minimizer in alkyds was the first of a series of new developments in drier technology. Cerium naphthenate, another development, did not by itself prove a suitable cobalt substitute, showing only fair drier properties and excessive yellowing. A combination, however, termed rare earth naphthenate, comprising 50% cerium and 50% lanthanum, together with infinitesimal traces of praseodymium and neodymium, gave excellent results both as to baked drying speed, absence of discoloration, improved mar resistance and improved adhesion. Rare earth naphthenate 4% metal content used in the amount of 0.3% to 0.08% metal based on the resin solids, gives, compared with other metallic driers, increased cross linking in baked finishes with resulting tougher and harder films, as well as improved water and soap resistance. Zirconium, the third development, in the form of a metal complex, subsequently was found to be a satisfactory partial substitute for cobalt and manganese in air drying systems, and can be used to replace 40% of the cobalt or 50% of the manganese. A still more recent development is the use of methyl ethyl ketone peroxide, dodecylmercaptan and diethylaniline as cobalt activators for the air drying of polyester resins. *American Ink Maker* 32, No. 2, February, 1954, page 43 (abstract only).

NOVEL INK MILEAGE NOMOGRAPH IS DESIGNED TO PROMOTE BUYING AND SELLING OF PREMIUM PRINTING INKS. P. H. Zars. *American Ink Maker* 32, No. 4, April, 1954, pages 29-30 and 69 (3 pages). This nomograph takes into account specific gravity, relative color strength, and price per pound to indicate the relative value of an ink in advance of actual mileage determination.

RHEOLOGY OF PRINTING INKS IV, INITIAL TRAPPING AND PICKING STUDIES. A. C. Zettlemoyer, C. T. Dickert, W. C. Walker and Raymond R. Myers. Amer. Chem. Soc. *Division of Paint, Plastics and Printing Ink Chemistry*, March 24-April 1, 1954, pages 95-107 (13 pages); *American Ink Maker* 32, No. 4, April, 1954, pages 42-3 (abstract only). Neither Inkometer readings nor viscosity measurements predicted reliably the trapping sequence of a series of randomly selected commercial inks. The trapping sequence and picking tendencies of a special series of closely related inks were predicted well by the Inkometer and not as reliably by viscosity measurements. The work reported here indicates that neither the Inkometer nor the viscometers studied are completely reliable for predicting the trapping or picking behavior of printing inks, but the correlation improves if the inks contain similar extenders and vehicles. The properties measured by these instruments are not identical with those which control trapping and picking. Pick testers warrant investigation as tack measuring instruments.

INK DRYING

MECHANISM OF DRIER ACTION. E. R. Mueller. *Abstracts of Papers, American Chemical Society 124th Meeting*, September, 1953, pages 5P-6P (Abstract presented here in its entirety). The probable mechanism of the action of metallic driers is discussed in relation to the generally accepted theories, now fairly well established, for the manner in which drying oils and air-drying finishes gel or "set". A brief review of peroxidation and polymerization mechanisms for drying oils and air-drying finishes precedes the discussion of the role of the driers. Experimental work on several air-drying varnishes is presented. It was shown that the maximum infra-red absorption in the 2.9 micron band (which measures —OH) was greatest up to the "set" time. Moreover, if this is correlated with the ultraviolet and peroxide development data of other workers, there appears to be an excellent relationship between peroxide development, induced conjugation, and peroxide decay. When two "optimum" driers are used which differ considerably in composition but produce the same overall drying times, the infra-red data almost exactly superimpose each other. This is taken as evidence that the mechanism of the action of these driers is similar at 30° C. It is postulated that the principal role of the driers is to initiate peroxidation so that the autoxidation can proceed. It is theorized that driers initiate shortlived chain reactions. The concentration of driers is significant until a level is reached to obtain maximum speed of peroxide development.

CATALYSIS BY COMPLEXES. I. THE DRYING OF LINSEED OIL. A. C. Zettlemoyer and Raymond R. Myers. *Ibid.*, pages 12-23 (12 pages). Economical replacement of conventional drying catalysts for oleoresinous vehicles by metal complexes has been demonstrated. A means has been shown whereby cobalt can be replaced by manganese and iron in conjunction with a suitable amine additive. In some cases manganese catalysis was improved to the point at which it was superior to cobalt catalysis; in general, the greatest improvement occurred with diamines or other difunctional amines possessing resonant structures and by certain amines of large steric requirements. Iron was susceptible to improvement by the same types of amines and to a greater extent in proportion to its original activity than was manganese.

THE MECHANISM OF DRIER ACTION. E. R. Mueller. *Ibid.*, pages 161-181 (21 pages); 7 figures, pages 182-6 (5 pages). The author discusses the processes involved during drying, a proposed mechanism for drier action, and experiments that should be carried out to elucidate the chemical changes taking place.

DRIER AND INK. E. E. Flaherty. *Graphic Arts Monthly* 25, No. 5, May, 1953, pages 108, 110, 112, 114, 116 and 118. Paste drier should be used in first down colours on four-colour dry process work and in inks that dry easily, such as chrome yellows, iron blues. It is good in light tints. Cobalt drier is essential for black inks. It is also best for certain hard drying colours like alkali blue, the tungstated colours, and on any job which goes only once through the press. Do not use it in delicate tints, because the rather strong colour of the cobalt may alter the colour sufficiently to spoil a good job of colour matching. A two-way drier is the most useful all-around drier. It can be used effectively in practically every situation although the very best results might be achieved with one or the other of cobalt or paste. Regardless of what drier you use, proceed with caution. Drier should always be weighed out on an accurate scale sensitive to ¼ oz. Many a good working ink has been ruined by excessive drier additions. Certain conditions such as waterlogging, slimy form rollers, scumming, stripping, excessive plate wear, can sometimes be traced to excessive drier additions. *Printing Abstracts* 8, No. 8, August, 1953, page 375.

GENERAL

MAKEREADY AND RELATED FACTORS IN WEB OFFSET. Don Frenck. *Modern Lithography* 21, No. 1, January, 1953, pages 38-9, 111, 113 and 115 (5 pages). Differences and similarities in web and sheet offset printing are discussed. Makeready procedures on web offset are described with specific differences to sheet-fed offset being register, packing, tension, and inks. Web offset is in its infancy, and therefore presents a challenge to those 10,000 impressions an hour and up; thus makeready methods must be maintained to raise production.

AIR CONDITIONING IN A MODERN LITHOGRAPHIC PLANT. W. H. Junker. *Graphic Arts Monthly* 25, No. 8, August, 1953, pages 69-70, 72, 74 and 75 (5 pages). The moisture sensitivity of paper, inks, plates and films has long made it difficult to maintain product quality in offset lithography. Cincinnati's Strobridge Lithographing Company has obtained precise process control by employing a chemical-type dehumidification system to accurately control atmosphere humidity in its plant. The advantages of the Kathabar dehumidification unit are also described.

* HAZARDS FROM STATIC ELECTRICITY. *J. Franklin Institute* 254, No. 3, September, 1952, pages 243-45. Static electricity is a distinct hazard in many industrial programs. The National Bureau of Standards has studied the problem and attempted to set standards for floor coverings for industrial conductive floors. These floors need only be moderately good conductors of static electricity—a resistance of one million ohms or less is ample for this purpose. *Monthly Abstract Bulletin* 39, No. 3, March, 1953, pages 195. The Journal is published by the Franklin Institute of the State of Pennsylvania, Benjamin Franklin Parkway at 20th Street, Philadelphia 3, Pennsylvania.

DRY OFFSET. Philip R. Grant. *Modern Lithographer and Offset Printer* 49, No. 1, January, 1953, pages 15-16 (2 pages). The ink rollers on the press were important—they had to be well balanced, and roller bearings had to be used. Clamps had to be modified so that leading and trailing edges had a less sharp bend. Plates were etched 10 to 15 mills (one thousandths of an inch).

FULL COLOR OFFSET NEWSPAPER PRODUCTION. Part One. *Modern Lithography* 21, No. 9, September, 1953, pages 54, 59 and 111 (3 pages); cf. *American Newspaper Publishers' Association Mechnical Bulletin No. 483* and *Modern Lithography*, May and September, 1952. This article is a detailed report on the use of offset lithography by the Argus and Australasian Ltd. The presses, speeds, plates, inks, etc. used are all thoroughly described.

DRY OFFSET. Part One. *Modern Lithography* 21, No. 6, June, 1953, pages 38-40, 155 and 157 (5 pages). Some historical data concerning the thirty-year old process—high etch or dry offset —which has moved into the graphic arts limelight. Description of what is being done and a summary of the chief problems are presented.

DRY OFFSET. Part Two. *Modern Lithography* 21, No. 7, July, 1953, pages 34-5 and 103 (3 pages). Concluding the discussion of the process—primarily the problems of the process listing advantages and disadvantages, with a resume of present day users.

CONTROL INSTRUMENTS FOR OFFSET LITHOGRAPHY. 2. Henry R. Long. *National Lithographer* 60, No. 11, November, 1953, pages 26-30 (5 pages). This article contains a discussion of densitometers, diaphragm controls and paper control with a digest of instruments on the market.

USE OF DIMERCAPROL (BAL) OINTMENT IN CHRONIC CHROME DERMATITIS. H. N. Cole, Jr., *Lithographers Journal* 38, No. 7, October, 1953, pages 16-18 and 64 (4 pages); Reprint from A.M.A. Archives of Dermatology and Syphilology, January, 1953, Vol. 67, pages 30-36. Report of a limited study involving seven rabbits and seven men. Rabbits with experimentally produced dermatitis showed 50 to 75% improvement in one week of daily applications of Bal ointment. All seven men had chronic chrome dermatitis. One could not tolerate Bal ointment. Two were hospitalized and given daily applications. Their symptoms completely disappeared in two weeks. The remaining four patients continued at their work but received daily applications of Bal ointment. They showed up to 75% improvement after two to five months. It was concluded that Bal ointment may be of value in treatment of chronic chrome dermatitis.

COLOUR PROBLEMS IN LITHOGHAPHIC PRINTING. J. H. Brittain and A. D. Lott. *Journal of the Oil and Colour Chemists' Association* 36, No. 401, November, 1953, pages 601-615 (15 pages); discussion, pages 615-618 (4 pages). The colour produced by a lithographic printing ink depends principally on its film thickness and the reflectance of the background, but also on several other factors. The present methods in general use of evaluating the optical properties of these inks are considered to be inadequate. The diffuse reflectance curves of two inks laid down over several neutral backgrounds at a range of film thicknesses have been measured and are shown to follow certain patterns. From such curves the coefficients of absorption and scattering have been calculated for both inks by the application of the Kubelka-Munk equation. Reflectances predicted from these data compare well with measured values and indicate that this relationship may be of practical use in the study of lithographic printing inks.

THE APPLICATION OF EPOXY RESIN ESTERS TO METAL LITHOGRAPHY. E. R. Lawson. *Modern Lithography* 21, No. 1, January, 1953, pages 57-8 (2 pages). An academic discussion of the Epoxy Resin Esters with relation to their use as varnishes in the metal finishing industry in place of tinplate. The superior physical properties of the modified resins (esters) are pointed out.

* PLANT PRODUCTION IMPROVED BY HUMIDITY CONTROL SYSTEM. Empire Box Corporation and J. Robert Lewis. *Boxboard Containers* 71, 730, October, 1953, pp. 32-5. The case history of the corporation and data supplied by the second author are analyzed to discuss possible savings that may be expected in the use of complete or partial air conditioning. From the records and data the following conclusions were reached: when boxboard is processed with a moisture content between 5.7 and 6.3%, little trouble can be expected from cracked scores; a difference of as much as 1% in the moisture content of boxboard; an R.H. of 50% is the most desirable indoor humidity; and humidification with unitary-type equipment will improve upon dry-air and unstable-humidity conditions. Starting with the installation of Walton humidifying units in the receiving and stock-storage rooms, these were extended to pressrooms and the folding, stripping, and gluing departments; none were placed in the laminating room which is subject to steaming nor in the shipping department. Although the problems of cracked scores and poor registry have not been entirely eliminated, the humidifiers have reduced them to a degree that they can be considered a worthwhile investment. 2 tables and 6 figures. *Bulletin of the Institute of Paper Chemistry* 24, 3, November, 1953, p. 175. Boxboard Containers is published at 22 East Huron, Chicago 11, Illinois.

MAGNIFIERS: THEIR IMPORTANCE AND USES IN LITHOGRAPHY. Paul W. Dorst. *Graphic Arts*

Monthly 25, *10*, October, 1953, pp. 110, 112, 114, 116, 118, 120, 122, 124, 126, 160, and 162 (11 pages). The importance of the use of good magnifiers in lithography is discussed in considerable detail by the author. How to choose a magnifier, how to measure its power and how to use it are among the subjects discussed.

CONTROL INSTRUMENTS FOR OFFSET LITHOGRAPHY. 3. Henry R. Long. *National Lithographer* 60, *12*, December, 1953, pp. 26-29; Digest with illustrations pp. 30-44 (9 pages). This installment covers spectrophotometers and colorimeters, color temperature meters, color standards as controls, consumer acceptance control instruments with a digest of existing instruments.

SIDELIGHTS FOR METAL LITHOGRAPHERS. M. A. Glaser. *Modern Lithography* 21, *12*, December, 1953, pp. 89-90 (2 pages). A universal shading vehicle (a new type of resin compatible with most oleo-resinous, alkyd, apoxy, and vinyl roller coatings, but not named in the article) and some characteristics of silicones are described.

"THE CHEMISTRY OF LITHOGRAPHY." *Modern Lithographer and Offset Printer* 50, No. 1, January, 1954, pages 36-37 (2 pages). Comments on the value of Hartsuch's book "Chemistry of Lithography" in explaining the chemical reactions of the lithographic process to the craftsman.

AIR CONDITIONING AT PALM BROS. DECAL. CO. William H. Junker. *Modern Lithography* 22, No. 2, February, 1954, pages 54, 56, 59 and 60 (4 pages). How the installation of humidity conditioning enables the company to simplify and standardize procedures, increase production and maintain product quality. Details of the control operation are given.

CONTROL INSTRUMENTS FOR OFFSET LITHOGRAPHY. I. Henry R. Long. *National Lithographer* 60, No. 10, October, 1953, pages 26-30 (5 pages). Instruments for measuring blanket thickness and packing while on the press are listed. Also pictures and descriptions of other thickness and length measuring instruments are given.

IS OFFSET SUITED FOR MAGAZINE PRODUCTION? Irving B. Simon. *Modern Lithography* 22, No. 2, February, 1954, pages 34-36 (3 pages). A discussion of the relative abilities of letterpress, gravure and offset to meet the demands of magazine production, with mention of the better known magazines being printed by offset.

THE CARE AND STORAGE OF CHEMICALS. Russ Waddell. *National Lithographer* 61, No. 2, February, 1954, pages 26-28 (3 pages). The fundamentals of the care and storage of chemicals basically are (1) good record keeping and (2) rotation of inventory. Proper storage and handling of and dangers from chemicals used in a lithographic plant are discussed.

LITHOGRAPHING GOLD INK. Ernest Blaha. *Graphic Arts Monthly* 26, No. 3, March, 1954, pages 89-90 (2 pages). Discussion of author's experience in lithographing gold ink, primarily using a mixture of fine gold ink, silver ink and imitation gold for his ink. In long runs use bimetallic plates because of need for less water, thus less tendency for gold ink emulsification.

PHOTOLITHO NOTES. J. S. Mertle. *National Lithographer* 60, No. 10, October, 1953, pages 68-69 (2 pages). The author gives some brief notes on subjects of general interest to lithographers. This includes the refrigerated storage of presensitized plates, early publications on lithography, infra-red sensitivity, color blindness, color scanner, camera parallelism, stainless steel equipment, safelight testing and process developers.

CONTROL INSTRUMENTS FOR OFFSET LITHOGRPHY. 5. TIME AND SPEED MEASURING INSTRUMENTS. Henry R. Long. *National Lithographer* 61, No. 3, March, 1954, pages 36-37 and six-page digest with illustrations (8 pages). Timing devices including recorders, light integrators, and speed indicators and controllers, are described.

*IMPROVED LITHOGRAPHIC PRINTING APPARATUS. *British Patent 700,121.* Coates Brothers and Company. *Tin Printer and Box Maker* 30, No. 351, April, 1954, page 14. A lithographic printing apparatus comprises a bi-metal roller for scavenging and applying moisture to the damping roller, having a surface part consisting of an ink-receptive metal and part of a metal which is water receptive and, at least when damp, ink repellent, arranged so that each operative part of the damping roller is, in operation, contacted by both metals, during the course of several revolutions of the damping roller, suitably four or five revolutions.

OFFSET BLANKET. E. Gurin. *Modern Lithographer and Offset Printer* 49, No. 12, December, 1953, page 19. Use as little pressure as possible, use a cleaning solvent having a boiling range of 190-265° F. and no oily residue, use the minimum amount of cleaning solvent and get all the ink off. Do not use turpentine, carbon tetrachloride or carbon disulphate as a blanket wash.

MECHANICAL COLOR SEPARATIONS. COPY PREPARATION FOR FAKE COLOR. H. C. Latimer. *Graphic Arts Monthly* 26, No. 5, May, 1954, pages 96, 98 and 114 (3 pages). A method of "fake" or mechanical color separation is described for those who cannot afford the cost of four-color process work. The quality of this type of work should not be oversold because it does not equal process color methods.

*DIRECT PROJECTION OPTICAL SYSTEM HAVING CONTROLLED EFFECTIVE DIAMETER OF LIGHT SOURCE. *U. S. Patent 2,682,195.* Richard N. Kauffman. *Official Gazette* 683, No. 5, June 29, 1954, pages 1054-5. 1. In a direct projection optical system having a high intensity carbon arc light source, a pair of plano-convex lenses adapted to condense the light received from the source and transmit it through a negative, and a process lens adapted to transmit the light passed through the negative to a light sensitive surface; the combination of a reflector placed behind the light source, a second pair of plano-convex lenses in light receiving relation to said reflector, a planar ground glass plate disposed in spaced relation to said second pair of lenses at the light output side thereof, and means adjustably mounting said second pair of lenses and said process lens for adjustable movement relative to each other.

PLATES

*HOW TO TEST PHOSPHATE COATINGS. *Products Finishing* 17, May 1953, page 60. A note on an investigation of tests that might prove useful in determining the nature and uniformity of phosphate coatings and the intrinsic protective value of finishing systems incorporating phosphate coatings, and has resulted in several proposed tests. *Telescoping the Technical News* 10, No. 11, August 21, 1953, page 362. Products Finishing is published by Gardner Publications, Inc., 431 Main Street, Cincinnati 2, Ohio.

SOME ASPECTS OF HIGH SPEED LITHO COATING. C. H. Groff. *Modern Lithography* 22, No. 2, February, 1954, pages 85 and 87 (2 pages). The problems involved in high speed litho coating are: 1. reduced oven time, 2. coating fly off the rollers, 3. edging—reverse sides of the sheets take coating at the leading edge, 4. leveling becomes poorer, 5. flashing—non-uniformity of coating on rollers, and 6. ghosting—marks produced by contact with the oven wickets. Coating qualities

necessary to reduce these problems are: 1. high solids, 2. low viscosity, 3. rapid drying, 4. fast solvents, and 5. slow solvents.

PRESS — INK AND DAMPENING SYSTEM

A NEW BI-METAL DAMPING TECHNIQUE. A. C. B. Mathews. *Penrose Annual* 47, 1953, pages 129-130 (2 pages). The Coates' Spiralchrome scavenging roller is especially suitable for controlling the damping of bimetallic plates. In this roller equally spaced, narrow helices of chromium are placed on the roller, leaving alternate helical areas of basic brass or copper-plated steel. The chromium areas feed the water forward when passivated as for bimetallic plates and the brass or copper areas collect the ink. *Printing Abstracts* 8, No. 5, May, 1953, page 218.

*THE AIR DOCTOR DAMPENING SYSTEM. U. S. Pat. 2,604,848. W. G. Mullen. *Penrose Annual* 47, 1953, pages 126-8 (2 pages); *National Lithographer* 60, No. 3, 1953, page 43; *Modern Lithography* 21, No. 3, 1953, page 50. Prior to the plate contacting the ink form rollers, a controllable excess of fountain solution is applied which is subjected to the knife-like action of the air delivered under pressure by the Air Doctor, directed to the plate surface. The air pressure is adjusted to exert sufficient force to reduce the water film to a minimum in the non-printing areas. The image areas when subjected to the same knife-like action of the Air Doctor are rendered dry and free of any entangling moisture. The system is explained in detail and illustrations are given. *Printing Abstracts* 8, No. 5, May, 1953, page 222.

*THE DAMPING OF THE MACHINE PLATE, A PROBLEM OF PLANOGRAPHIC PRINTING? Kraus. *Deutscher Drucker* 51, No. 7, 1953, pages 315-6 (in German). Mention is made of the following patents of Larsen: (1) The feeding of water to the inking roller (1937); (2) The use of paste ink repellents in conjunction with the above process (1948). The repellent utilized glycerol or tragacanth as a carrier. Examples of suitable mixtures were: (a) 50 parts glycerine, 6 parts potassium phosphate, 6 parts calcium silicate, 8 parts of tragacanth and 130 parts of water, or (b) 50 parts glycerine, 8 parts calcium chloride, 5 parts potassium phosphate, 2 parts of carbolic and 5 parts of tragacanth. *Printing Abstracts* 8, No. 10, October, 1953, page 531. Deutscher Drucker is published by Edward Boehme, Lichterfelde West, Berlin, Germany.

SYNTHETIC RUBBER ROLLERS. B. W. Hubbard. *National Lithographer* 60, No. 9, September, 1953, pages 34-7 (4 pages). New synthetic rubber rollers have been formulated to meet the increasing demand of metal decorators resulting from new developments in coating and solvents in their industry. Information necessary to make proper selection of rollers for the particular job is given along with discussion of advantages of using synthetic rubber rollers by the metal decorators.

CARE OF ROLLERS. *Fuchs and Lang Litho Letter*, May-June, 1953, 2 pages. Neglect of rollers can result in nonuniform printing and difficulty in controlling ink and water balance. Stripping can be caused by an improper water fountain mixture or running the ink too spare.

INK PILING ON THE ROLLERS. *Fuchs and Lang Litho Letter*, May-June, 1953, 3 pages. (When ordered with preceding article, the charge will be for four pages.) Ink piling on the rollers can be caused by waterlogging, lack of lubrication caused by adding long varnish, paper picking, and incorrect feed to the rollers.

DAMPENING ROLLERS. H. Howard Colehower. *National Lithographer* 60, No. 9, September, 1953, pages 38-40 (3 pages). The role of dampeners in lithography is of great importance. Different types of dampener covers are discussed along with their desired qualities. Proper use of dampeners will extend their life and prove more profitable for the lithographer by doing a better job.

* IMPROVED INK AND MOISTURE APPLYING DEVICE FOR LITHOGRAPHIC PRINTING MACHINES. *British Patent 693,183.* Addressograph-Multigraph Corporation. *Tin Printer and Box Maker* 29, No. 346, November, 1953, page 14. Ink and moistening solution are fed from an ink fountain and a moisture fountain respectively to a mastersheet mounted in the machine so as to enable an image on the mastersheet to be produced. A sheet engaging roller is engageable with the mastersheet. A first train of rollers picks up ink from the ink fountain and transfers it to the sheet engaging roller. A second train of rollers picks up moisture from the moisture fountain and transfers it to the sheet engaging roller. The engagement pressure between at least some of the rollers of the second train is controllable so as to regulate the amount of moisture withdrawn from the fountain.

AIR DOCTOR DAMPENING SYSTEM. W. G. Mullen. *Modern Lithographer and Offset Printer* 49, No. 6, June, 1953, pages 14 and 16 (2 pages). In an efficient dampening system it is the quantity of water on the non-printing areas that is important, together with an absence of water on the inked parts of the surface. In the air doctor system a continuous film of fountain solution is applied to the plate via a rubber wetting roller which is rotated in the solution at a speed adjusted to apply a minimum excess to the plate. This rubber roller is arranged 0.004 inch from the plate and the solution is transferred without contact between the wetting roller and the plate. This means that the wear from the usual contact is entirely avoided. The air doctor comprises an effuser and vacuum chamber which is positioned in correct relationship to an air pressure chamber at an angle to the effuser so as most efficiently to remove excess water.

A NEW CLEANSING AGENT FOR WASHING MACHINES FOR DAMPENING ROLLERS. *I. G. T. Nieuws* 6, 5, 1953, p. 84 (in Dutch). The cleansing agent consists of Lissapol N (I.C.I.) carboxymethyl cellulose, sodium triphosphate and water. *Printing Abstracts* 8, 8, August, 1953, p. 383.

THOUGHTS ON DAMPENING. J. Torland. *Modern Lithographer and Offset Printer* 49, No. 9, September, 1953, pages 25-27 (3 pages). Dampening of plates and ink emulsification are two problems which are usually due to one condition, that of setting of dampeners. Troubles that arise due to settings, and recommended manner of setting them to remedy the troubles, are mentioned. Simple daily care would remedy most other problems relating to dampeners.

HOW TO CONSERVE YOUR ROLLERS. Pamphlet issued by Ideal Roller and Manufacturing Company, 2 pages. Rollers are important part of all printing presses and are one of the most important supplies bought. All plants should be prepared in case of any emergency to have sufficient replacements that are in usable condition. Information regarding the proper care of all rollers is given, with necessary precautions.

SETTING AND CARE OF LITHO ROLLERS. Emmett E. Flaherty. *Graphic Arts Monthly* 26, No. 3, March, 1954, pages 82, 84, 86, 126 and 128 (5 pages). Basic press setting of litho rollers in inking system, with pertinent mention of their maintenance to insure proper functioning, i.e., proper setting and wash-up.

THE INKING UNIT. Howard J. Watrous. *Graphic Arts Monthly* 26, No. 1, January, 1954, pages 80, 84, 86, 88 and 90 (5 pages). General discussion of inking unit on offset presses with particular emphasis on setting inking rollers. Some difficulties resulting from poor roller conditions are discussed along with corrective methods.

*DAMPENING MECHANISM CONTROL MEANS FOR ROTARY OFFSET PRINTING PRESSES. *U. S. Patent 2,672,090.* E. F. Dell. *Official Gazette* 680, No. 3, March 16, 1954, 660-1. 1. Dampening means for an offset printing press of a character having a rotatable printing cylinder and in which the cylinder carries form roll cam means comprising, form roll means biased toward said cylinder and adapted to be engaged by said form roll cam means to be disposed in a position out of an engagement with said cylinder, dampening fountain means including fountain roll means, mounting means for mounting said dampening fountain means for movement toward and away from said form roll means comprising, stop means for limiting movement of said dampening fountain towards said form roll means, spring means for urging said dampening fountain means against said stop means, and second cam means adapted to be carried by said cylinder for moving said form roll means to a position in engagement with said fountain roll means.

*PROCESS AND PRODUCT FOR DAMPENING LITHOGRAPHIC PLATES. *French Patent 1,020,124.* B. Carnaut. *Demande* 13.6.50, *Delivre* 12.-11.52. By running the dampeners for a few minutes with a glycerine-water solution in the proportions 800 ml. glycerine, 100 g. sodium sulphate and 800 ml. water, a thin film is applied to the plate, so that the dampening can then be discontinued for 10-20 minutes before it is necessary to dampen again.

*LITHOGRAPHIC PRESS WITH COMBINED INKING AND WATER SPRAY DAMPENING. *U. S. Patent 2,678,001.* William W. Davidson, Jr. *Official Gazette* 682, No. 2, May 11, 1954, pages 389-90. 1. A lithographic press including a plate holder, an ink-applying unit including a final ink form roll and supply and distribution means including at least one preliminary roll engaging said form roll, an inker branch including an ink form roll engaged by the plate as it approaches the final form roll and supplied with ink from said supply and distribution means, a sprayer for applying a spray of aqueous ink repellent to the inker branch whereby repellent is received by the form roll thereof predominantly over the final form roll, and drying means adjacent to the unit other than to said branch and along the course of ink movement therein beyond said branch whereby the final form roll is maintained relatively free of repellent.

*DAMPENER FOR PRINTING PRESS. E. C. Grembecki. *U. S. Patent 2,108,984.* *Official Gazette* 487, No. 4, February 22, 1938, page 753. 1. Dampening mechanism for printing presses and the like comprising a housing having an opening for confrontation with a press plate cylinder, means providing a water spray in said housing, a power driven propeller supported within the housing and having a plurality of apertured arms rotatable to intercept said sprays and break up the water into fine particles, together with means for moving air past said propeller means in said housing to carry said particles through said opening on to said cylinder.

PRESSES

OFFSET PRESSES FOR PUBLICATION PRINTING: AMERICAN AND EUROPEAN VIEWS. *British and Colonial Printer* 153, No. 16, October 16, 1953, pages 470 and 472 (2 pages). A discussion of web-fed offset presses for publication printing which reviews some of the old design presses in use and the new presses. Merits of blanket to steel impression and blanket to blanket im-

pression were discussed. Unit section for color presents a drawback for register while a design for common impression cylinder for four-color units would give perfect register.

OFFSET PRESS SPECIFICATIONS. *Modern Lithography* 21, *11*, November, 1953, pp. 64-70 (7 pages). Specifications corrected to October 1, 1953, for ATF-Webendorfer, ATF-Mann, Miller Ebco, Babcock, Hoe, Harris, Miehle, Rutherford, Trailblazer, Webendorfer and Planeta, Milton, Plamag.

NEW OFFSET PRESS. *Modern Lithographer and Offset Printer* 50, No. 1, January, 1954, pages 34-6 (3 pages). Color Metal of Zurich offers new offset press of small sheet size 15 x 20" with big press features, namely, swing arm feed, stream feed with speeds up to 8000 sheets an hour, and new patented dampening system where steel roller is slotted and fitted with nylon brushes which are removable to vary dampening. Additional information available from Soag Machinery Company, 7 Juxon Street, Lambeth, S. E. 11, England.

GENERAL

PRESS AND PAPER SURFACE SPEEDS. *Share Your Knowledge Review* 34, No. 7, April, 1953, pages 17-20 (4 pages). Unequal surface travel can be caused by: 1. Improperly set cylinders, 2. Improperly set register rack, 3. Improper packing. Troubles caused by it are: 1. Slurring, 2. Wearing of plates or form, 3. Faulty register, 4. Packing tearing loose, 5. Plates tearing loose, 6. Sheet pulling out of grippers. Preventative Measures: 1. Keep bearers in contact, 2. Correctly set register rack, 3. Pack correctly.

* CORROSION INHIBITOR. *J. Scientific Instruments* 30, February, 1953, page 62. Wrapping materials incorporating sodium benzoate such as paper, etc., gives good corrosion protection to metallic objects and, in particular, it is claimed that steel, tinplate, chromium-plate and zinc objects can be given complete protection. These wrapping materials may be of paper, regenerated cellulose, cellulose actetate film and cotton tape. Other media in which it has been suggested sodium benzoate might be incorporated are protective films such as rubber latex and emulsions of plastics, cutting oils and solutions and paints. *Telescoping the Technical News* 10, No. 6, June 19, 1953, page 178. The Journal is published by the Institute of Physics, 47 Belgrave Square, London 1, England.

SIMPLIFICATION OF THE LENTICULAR SYSTEM: THE LENTIC CAMERA AND AUTOSTEREOSCOPIC ADVERTISING E. F. Linssen. *British Journal of Photography* 99, October 24, 1952, page 520. A brief description is given of the Lentic camera, designed by C. Butement, which is used in the production of autostereoscopic pictures. The camera is fitted with six lenses, giving six 2¼-by 2¼-inch negatives on a standard No. 120-size roll film. The six negatives are projected by a special enlarger onto the lenticular screen placed in contact with a sheet of bromide paper to give the finished stereoscopic picture. By the adoption of this procedure, the camera can be made easily portable. The previously designed Bonnet camera, where the lenticular screen was incorporated in the camera, was large and heavy, and could be used only in a studio. *Monthly Abstract Bulletin* 39, No. 3, March, 1953, page 177.

OFFSET STILL GAINING FASTEST. *Modern Lithography* 21, No. 10, October, 1953, page 66. Figures are quoted from the 1952 Annual Survey of Manufactures to show that lithography has outdistanced other commercial printing processes in rate of increase during the past five years.

ALL ELECTRIC DRIVES. Eugene W. Macoy. *National Lithographer* 60, 9, September, 1953, pages 26-9 (4 pages). A review of the early systems of driving and synchronizing the various tandem units in a metal decorating plant. Modern variable speed, synchronized systems of the Selsyn Tie-Amplidyne type are also described, including the use of ACA variable speed motors.

*THE ACCURATE CONTROL OF RELATIVE HUMIDITY. R. G. Wylie and A. F. A. Harper. *Australian J. Appl. Sci.* 3, No. 3, 1952, pages 219-27; *J. Textile Institute* 44, No. 5, 1953, page A364. A method and apparatus for the control of humidity, by means of which the R.H. in a closed cabinet can be controlled with an accuracy of ± 1% R.H. are described. The R.H. can be controlled independently of the cabinet temperature or made to depend on cabinet temperature in a presensitized manner. *Printing Abstracts* 8, No. 8, August, 1953, page 410. Australian Journal of Applied Science is published by the Commonwealth Scientific and Industrial Research Organization, 314 Albert Street, E. Melbourne C2, Victoria, Australia.

INK STANDARDIZATION. Robert J. Butler. *National Lithographer* 60, No. 9,

September, 1953, pages 46-8 (3 pages). The author recommends standardization of inks used for long runs and the revival of the art of color mixing to assist in making the fullest use of inks carried on inventory. Standardization can reduce costs by reducing the number of "long runners" carried in inventory and reducing the ink wasted by over-ordering for small runs.

* 3-DIMENTIA FEVER IS RUNNING HIGH. R. Savery. *Productionwise* 2, No. 1, July, 1953, pages 38, 40-2. 3-D illustrations can be photographs or artwork, halftones or line. Type or lettering can be overprinted. Current examples have been printed by both letterpress and offset lithography, sheet-fed and web-fed, from plastic plates, photoengravings, electrotypes, litho plates, on cylinder presses, multiliths and rotaries. Pressroom technique differs in no essential respect from that employed normally. Given the plates, the proofs, the register guides, and the ink specifications, the pressman proceeds in standard fashion for two-colour printing. Both wet and dry printing have produced good results. In the reproduction of photographs, either by offset or letterpress, the basic requirement is that they be shot with a stereoscopic camera. This camera is equipped with two lenses that take two views of the same subject simultaneously from slightly different positions. One printing plate is made from each negative or photoprint. The plates are printed in a red that tends toward orange, and a blue that tends toward green, with a slight "disparity" in the reproduction register. When viewed through the spectacles, the red lens for one eye filters out the printed red, and the blue or green lens for the other eye filters out the printed blue. The two eyes thus are registering two separate images that merge into one with a three-dimensional look. *Printing Abstracts* 8, No. 10, October, 1953, page 540. Productionwise is published by Colton Press, 468 Fourth Ave., New York 16, N. Y.

SIX STEPS TO 3D. *Modern Lithography* 21, No. 10, October, 1953, pages 59 and 171 (2 pages). Excerpts from an article by William B. Freedman in "Rush" magazine, New York. Six important steps in the production of stereo (anaglyph) printing are given as: (1) photography must start with a stereo camera, (2) the negatives must be cropped to proper size, (3) the plates should be registered with the center area being slightly to the right of the red plate and slightly to the left of the green plate, (4) adjustment of the inks should be made after viewing them with the filter spectacles, (5) drying printing is necessary to prevent blurring, and (6) the filters of the spectacles should transmit equal amounts of orange-red for one and green-blue for the other.

METALLIZING PRESS CYLINDERS. H. David McKinney. *Graphic Arts Monthly* 25, No. 10, October, 1953, pages 178, 170, 172, 174 and 196 (5 pages). Accidents in the pressroom may cause damage to press cylinders which in old days would cause long delays and undue worry. Today damaged cylinders are made "better than ever" by metallizing. Damaged cylinders are first turned down, grained, sprayed with a metal to higher than finish diameter and then ground to finish diameter. Original cylinders are made from cast iron, susceptible to corrosion and wear. Now stainless steel is sprayed on, giving the cylinder lasting durability. Any metal can be sprayed on, thus giving cylinders and even steel rollers new surfaces which are better for the process.

VARNISHING BY ROLL COATING. MATERIALS USED IN PAPER COATINGS. PART 1. H. Audino. *Modern Lithography* 21, *12*, December, 1953, pp. 39-42 (4 pages). The factors involved in varnishing are analyzed. This installment covers materials used in the paper coatings (organic solvents, film forming and non-flexible resins, plasticizers, and modifiers).

VARNISHING BY ROLL COATING. Part 2. BASIC PRINCIPLES OF APPLICATION. H. Audino. *Modern Lithography* 22, *1*, January, 1954, pp. 37-41, 109 and 111 (7 pages). (1) Some basic principles of varnishing by the roll coating method have been examined and commented upon. (2) Some features and qualities of the Chambers machine have been examined, and it has been shown that within limits the equipment serves a well merited place in the field. (3) Some features and qualities of the Christensen machine have been examined and it has been shown that this equipment is well designed and constructed to do a first class job at high speed, the speed ratio to the Chambers machine being approximately two to one.

RADIOACTIVE MATERIALS CUT STATIC EFFECTIVELY AT GOVERNMENT PRINTING OFFICE. *Modern Lithography* 21, *11*, November, 1953, pp. 61-2 (2 pages). Talks at the National Safety Council's Congress covered the good results obtained from the use of radioactive static eliminators in the GPO such as noise reduction.

HOW THE GPO CONTROLS STATIC. Eugene P. Ernest. *Modern Lithography* 22, *1*, January, 1954, pp. 44-5, 119 and 121 (4 pages). Static control by means of tinsel, high voltage eliminators, and radioactive materials is described. Tinsel, although widely used, is limited in effectiveness. High voltage eliminators are more effective than tinsel. Radium source eliminators proved satisfactory where other forms failed although problems with escape of radioactive materials were encountered.

HUMIDITY CONTROL IN THE PRINTING PLANT. L. L. Covert. *Canadian National Research Council Technical Information Service Report* No. 30, October, 1953, 8 pages. Discusses trouble from static electricity, paper curling, and poor inking caused by improper humidity control. Tables and 15 references. *Battelle Technical Review* 3, No. 2, February, 1954, page 96a.

LIGHTING FOR PRINTING PLANTS. T. E. Pickering. *Modern Lithographer and Offset Printer* 50, No. 1, January, 1954, pages 24-26 (3 pages). A general discussion of the fundamental requirements and the specialized problems of lighting for printing plants. Among the problems discussed are copyboard lighting, retouching benches, examination of progressive proofs, and compositing.

PRINTING ACCIDENTS. *Modern Lithographer and Offset Printer* 50, No. 1, January, 1954, pages 21-2. An excerpt from "Accidents, How They Happen, and How to Prevent Them," published for the Factory Department, Ministry of Labour and National Service, H. M. Stationery Office, which cites two examples of serious accidents occurring during the operation of printing machinery with suggestions for prevention.

WORKFLOW. Olin E. Freedman and George W. Erb. *Printing Equipment Engineer* 84, No. 6, March, 1954, pages 69-71 (3 pages). A discussion of patterns of workflow for the graphic arts, with a floor plan diagram to illustrate the rearrangement of a portion of a plant within the limitations of an existing building.

REPORT OF THE ACTIVITIES OF THE GRAFISKA FORSKNINGS-LABORATORIET DURING THE FISCAL YEAR 1952-1953. Gosta E. Carlsson. *Grafiska Forskningslaboratoriet Meddelande* No. 32, November, 1953, pages 1-35 (35 pages) (in Swedish). Research activities (ink and oil absorption and dimensional stability of paper, bending properties of board, ink transfer, drying agents for offset inks, the chemistry of the offset printing process, the development of Grafo Clean—an effective addition to the damping water, and studies with stereotyping mats), technical services rendered, and publications are reviewed. 7 illustrations. *Bulletin of the Institute of Paper Chemistry* 24, No. 5, January, 1954, page 394.

*HEAT SENSITIVE COPYING PAPER. *U. S. Patent 2,668,126.* Nelson W. Taylor and Bryce L. Clark. *Official Gazette* 679, No. 1, February 2, 1954, page 182. 1. A light-stable, heat-sensitive copying-paper adapted to provide clear and sharp copies of typewritten messages by methods herein described, comprising a thin flexible visibly contrasting support member having low heat conductivity and a thin opaque heat-transparentizable surface coating comprising a mixture of: (a) one hundred parts by weight of particles of transparent waxy material fusible at about 60-150° C.; (b) about 10-100 parts by weight of transparent infusible siliceous particles less than about four mils in diameter; and (c) sufficient transparent flexible organic film-forming binder, within the range of about one to about six parts by weight, to provide good resistance to dusting and rub-off of the coating without causing flaking thereof; the wax, siliceous particles, and binder each having substantially the same refractive index, and said binder being infusible at the fusion temperature of said wax.

*HEAT SENSITIVE COPYING PAPER. *U. S. Patent 2,663,654.* Carl S. Miller and Bryce L. Clark. *Official Gazette* 677, No. 4, December 22, 1953, page 1069. 1. A heat-sensitive copying-sheet for making direct, high contrast, clear detail copies of graphic subject-matter as herein described, said copying-sheet comprising a support having low thermal conductivity, and a heat-sensitive layer containing, uniformly dispersed in a film-forming, transparent binder non-fusing at temperatures below about 120° C., at multitude of closely spaced particles of at least two visibly inter-reactive solids of which one is a liquid at temperatures above normal room and storage temperatures and within the range of about 60-120° C. and is an iron salt of a solid long-chain fatty acid, and the second inter-reactive particulate solid is a phenol, said inter-reactive solids in said heat-sensitive layer being stable at temperatures less than about 60° C. and being rapidly visibly inter-reacted when the copying sheet is heated to 120° C. (See also Patents 2,663,655-2,663,657.)

*PRINTING. *British Patent 659,418.* Monsanto Chemical Company. *Abridgment of Specifications* XVI, 1953, page 217. *Set-off, preventing.*—The printed surface is treated with an aqueous or other liquid spray containing fine discrete particles of silica. The silica, e.g. comprising 1—20 per cent by weight of a water etc. dispersion, may be in the form of colloidal particles of which the average diameter is less than 1 micron or of which at least 50 per cent are of diameter less than 5 microns, preferably less than 1 micron. Suitable aquasols may be prepared as described in Specification 645,703 or 649,897, U. S. Patent 2,383,653, or an aerogel prepared as described in U. S. Patent 2,188,007 may be dispersed in water or alcohol.

*PHOTOSENSITIVE COATING CONTAINING A HYDROPHILIC COLLOID AND A POLYVINYL CHLORIDE DISPERSION. *U. S. Patent 2,675,315.* H. C. Staehle and L. E. Martinson, *Official Gazette* 681, No. 2, April 13, 1954, page 503. 1. A light-sensitive coating composition comprising a mixture of a bichromated gelatin, an aqueous dispersion of a resin selected from the class consisting of polyvinylidene chloride latex and polyvinyl chloride-polyvinyl acetate copolymers, the ratio of said gelatin to said aqueous dispersion being between about 1 to 2.5 and 1 to 5, said composition being adapted to produce a light-sensitive coating in which a reversal image can be formed by exposure to light and development in an aqueous solution.

*PREPARATION OF METALLIZED COPIES. *British Patent 697,036.* J. Heidenhain. *Photographic Abstracts* 34, Part 1, 1954, page 43. A bichromated albumen or shellac layer is exposed and the unhardened portions of the plate removed by washing. A metal, such as copper, chromium, silver, etc., is de-

posited on the plate by vaporization. The exposed portions of the plate are then dissolved off, e.g., by nitric acid, followed by an alcoholic solution of sodium hydroxide, leaving only the positive metal image. A negative image may be obtained by covering the layer and positive image with a further layer and dissolving out the two layers corresponding to the positive image. Sharper images of greater durability than those obtained with lead sulphide are claimed. The process is useful for the production of measuring scales.

* JUSTIFIER FOR TYPEWRITERS. *U. S. Patent 2,675,903.* A. H. Bailey. *Official Gazette* 681, No. 3, April 20, 1954, page 738. 2. The combination with a typewriter, having a carriage adapted to advance a predetermined distance with each operation of its space bar whereby the words of a line of typing may be separated a predetermined distance, of a justifier attachment involving: a platen movable laterally with respect to said carriage; a pair of relatively movable members secured respectively to said platen and said carriage and extending laterally beyond one side of said carriage; means for effecting relative movement of said members to cause lateral displacement of said platen so as to alter the spacing effected by said space bar; and an adjustable stop means and a reference scale for preselecting the extent of relative movement of said members and the corresponding displacement of said platen.

* PREVENTING OFFSET OF PRINT FROM FRESHLY PRINTED PAPERS. *U. S. Patent 2,673,520.* J. P. Bainbridge, Jr. *Bulletin of the Institute of Paper Chemistry* 24, No. 9, May, 1954, page 773. A spray or mist containing from 1 to 20% silica by weight in the form of particles less than one micron in diameter is claimed to prevent offset in the stacking or rewinding of freshly printed paper.

CONVERTING LETTERPRESS AND GRAVURE COLOR PLATES FOR OFFSET REPRODUCTION. Paul F. Williams. *Graphic Arts Monthly* 26, No. 5, May, 1954, pages 82, 84 and 86 (3 pages). A method of converting gravure and letterpress plates for offset is described with its limitations. Clean black proofs are made from the color plates, thus having the color separations needed to make camera reductions or camera enlargements which result in the lithographic plates. This method is especially valuable for advertising work with the great economic advantage.

VARNISHING BY ROLL COATING. 3. DRYING, CURING AND FUSING. H. Audino. *Modern Lithography* 22, No. 2, February, 1954, pages 40-42 and 115 (3 pages). This concluding article in the series deals with drying, curing, fusing, blushing and safety in varnishing operations.

PROCESSES — GENERAL

* CHEAPNESS AND SIMPLICITY MARK NEW UNESCO PRINTING PROCESS. D. Behrman *Unesco Courier* 6, No. 2, 1953, pages 8-9. A new printing process, so cheap and so simple that any teacher, aided by an artist, can use it, has recently been developed at Patzcuaro, Mexico. Designed primarily for the production of posters, the process is now in operation at the international centre, CREFAL (Centro Regional de Educacion Fundamental de America Latina), set up by Unesco, the organization of American States and the Mexican Government, to raise living standards through education by training badly needed teachers of fundamental education for Latin America. The process consists simply of engraving on wax, and from this wax "positive", casting a printing plate made of a mixture of carpenter's glue and glycerine—the same as used to manufacture printers' rollers. The result is a "negative" plate resembling a huge flexible stamp from which a poster can be printed without a press. *Printing Abstracts* 8, No. 5, May, 1953, page 247.

*ELECTROGRAPHY. *U. S. Pat. 2,647,464.* James P. Ebert. *Official Gazette* 673, No. 1, August 4, 1953, page 124. 1. An electric method of reproducing copy, comprising the steps of placing the copy to be reproduced in contact with the dielectric layer of an electrographic plate comprising a conductive backing plate with a dielectric coating layer, subjecting such assembly to an electrostatic discharge, removing the original copy from the electrographic plate, contacting the plate with an electrically charged powder, transferring the powder image so formed to a second surface and fixing the transferred image to said second surface.

DRAWING IN THREE DIMENSIONS FOR ANIMATION AND STEREOSCOPIC PROCESSES. E. F. Hiser. *J. Soc. of Motion Picture and Television Engineers* 59, No. 4, October, 1952, pages 287-92 (6 pages). A procedure is developed to allow stereo drawings to be made with a minimum of time and effort and still produce practical three-dimensional material. *Monthly Abstract Bulletin* 39, No. 3, March, 1953, page 177.

AN ANALYSIS OF THE VARIABLES IN DRY OFFSET PRINTING. PROGRESS REPORT NO. 1. R. E. Lewis. *American Newspaper Publishers Association,* Technical Report No. 12, May 27, 1953, 7 pages. The ANPA Research Lab is conducting an extensive research program on dry offset printing. Interest in the process lies in the possible application to newspaper supplement printing. Facilities have been set up at the Lab to carry the process through from the copy to the final prints, both from sheet-fed and web-fed presses. Each step in the process and all contributing factors involved are being carefully analyzed. Some of this work is being done cooperatively with interested suppliers and manufacturers who have more experience and equipment relative to their specialized field. The components under observation are as follows: The copy, negative, plate, engraving, inking rollers, inks, blankets, paper, press and printed results. Results to date, printed with 120-line screen on newsprint, are comparable, and in some ways superior, to gravure printed on newsprint.

SILK SCREEN MECHANIZATION. Victor Strauss. *Printing Equipment Engineer* 83, No. 12, September, 1953, pages 60-2 and 64 (4 pages); Paper Presented at TAGA, April, 1953. Silk screen has found acceptance as a printing process for two reasons: one aesthetic and the other technological. Screen prints have an almost three-dimensional color effect, the "hand painted" look, and screen printing can be performed on a vast variety of stocks, paper, metal, cork, glass, plastic, wood and cloth, for example, but also on finished objects such as bottles, toys, or mounting panels for electrical installations. These facts govern the problem of mechanization. Strong color is the result of extremely heavy ink deposits; this poses many problems not only in drying but in adhesion of sheet to printing form. Variety of stocks leads to variety of inks, piling variables on variables. Mechanization requires specialization. Several machines for special problems are exemplified: a drum printer, a printer for vials, a machine for dinnerware and one for bottles. Silk screen presses for paper and flat stocks have existed for a long time. The two most important older presses, the Tocker and the Selectasine are discussed in detail. Of the postwar presses the McCormick, the Reineke, the Four-Star-General and others are presented. Silk screen cannot be mechanized without overcoming rack drying. The governing factors concerning drying are analyzed and the latest efforts in mechanical drying are discussed.

*PROCESS OF MULTICOLOR ELECTRONOGRAPHIC PRINTING. W E. Huebner. *U. S. Patent 2,654,315. Official Gazette* 675, No 1, October 6, 1953, page 119 The method of reproducing an image in color upon print receiving ma-

terial and which comprises providing a plurality of printing couples arranged in sequential order and each including a printing member carrying at least a portion of the image to be reproduced, inking the image on the printing member of each of the couples with a colored ink which differs in color from that of the inks employed upon the other printing members, impressing an electrical precharge upon the ink after it is on the image carried by each member, creating an electro field of force at the printing zone for each couple, eliminating any preexisting electrical charge on the print receiving material, thereafter impressing an electrical precharge of predetermined polarity and value on said material, introducing said precharged material into the field of force of the first of said printing couples thereby effecting transfer of the precharged ink from the image to the material, eliminating the electrical charge remaining upon said material after it has passed through the field of force of said first couple; and repeating in succession for each couple the precharging of the material with an electrical charge of predetermined polarity and value, the introduction of the precharged material into the field of force of a printing couple with the image upon the printing member of each couple aligned with the image reproduced upon the material by operation of the preceding printing couple, and then the elimination of the electrical charge remaining on said material after it has passed through the field of force of a couple; the precharging of the ink upon the printing member of each couple and the precharging of the print receiving material prior to the introduction of the latter into the printing zone of that couple being effected by charges of opposite polarity; the precharge impressed upon the ink on the printing member of at least one of the printing couples being of opposite polarity to the precharge impressed upon the ink on other of the printing members of other of the couples

FULL COLOR OFFSET NEWSPAPER PRODUCTION Part Two. T. W. Brown. *Modern Lithography* 21, No. 10, October, 1953, pages 79, 82, 84-5 and 88 (5 pages). This is a detailed report on the use of offset lithography to produce R. O. P. color and newspaper supplements. Camera work, color correction, layout, platemaking (Aller plates), photocomposing and supervision are briefly described.

GERMAN INKLESS PRINTING. *American Newspaper Publishers Association Research Bulletin* 83, February 10, 1954, pages 15-16 (2 pages). A method for making a visible impression without ink has been developed by a German firm. Two sheets of treated paper are separated by a thin film of gelatin. Under pressure from a type character, the gelatin is broken, the sheets come into contact, and a reaction between them results in a visible image of the type character making the impression. A somewhat similar process has recently been announced by National Cash Register Company, Dayton, Ohio. The company believes their process will find immediate application in making up to seven copies of correspondence without a typewriter ribbon or carbon paper. Six or seven sheets of special paper are fed into a typewriter. A colorless chemical coating is present on the underside of the top sheet of paper. The impact of a type character forces the chemical into contact with a coating on the face of the second sheet, which turns blue wherever it has been struck.

* SILK-SCREEN PRINTING. L. Dubuit. *Sprechsaal* 85, 1952, page 529; *Society of Glass Technology* 37, December 1953, page 164A; *Telescoping the Technical News* 13, No. 2, April 16, 1954, page 50. Hand-operated appliances capable of speeds of 400-500 prints/hr. are provided with a control device for multicolour printings; a second and third colour can be applied at up to 300-400/hr. For the application of each additional colour, it is essential to have

the article correctly placed for the successive imprints. Semi- and fully-automatic machines can perform 3-colour printing at up to 300/hr. One of the greatest difficulties is the necessity for drying after each application of colour; this requires heat and time. The new thermoplastic colours have helped to overcome these difficulties, and will probably revolutionize the art of printing in the near future. Ordinary colour pastes are prepared in a fluid medium; the thermoplastic colours are mixed with wax and resin, and become fluid only between 50° and 100°. If these mixtures are applied to the stencil and warmed by some device, the colours can be transmitted through the gauze by the rubber scraper. Contact with the cold surface of the article solidifies the colour almost immediately and the print is dried in about 1/30 sec. thus, successive colours can be applied without any delay. The requisite heat can be provided by using a metallic gauze, insulated and arranged to act as an electrical resistance, or by making use of infrared radiation on the gauze. Sprechsaal is published at Müller and Schmidt, (13a), Coburg, Germany.

STANDARD REGISTER'S NEW PRINTING METHOD COMBINATION OF PHOTOGRAPHY, ELECTRONICS. *Inland Printer* 133, No. 1, April, 1954, page 74. A very brief description of the "Photronic Reproducer" intended for use in reproducing office records. The copy is produced on paper by projecting an image of original onto the back of a photoconductive plate. Electrostatic charges on opposite sides of the plate attract a charged ink mist to the copy paper which is adjacent to it.

GLASS CONTAINER PRINTING. *Neue Verpackung* 6, No. 2, 1953, page 68; *Packaging Abstracts* 10, No. 5, 1953, page 355; *Review* 6, 493; *American Ink Maker* 32, No. 4, April, 1954, page 47. Four processes are given: (1) the rubber stamp, which is seldom used; (2) silk-screen which is favored for milk, beer and soda water bottles, but has the disadvantage of being costly; (3) the offset process with stoving inks, which produces a weak print and is most successful with one-color printing; (4) offset with non-stoving inks, which is most common and produces good prints in and up to 3 colors in one operation. Die Neue Verpackung is published at Berlin-Grunewald, Bismarckplatz, Germany.

RESEARCH AND DEVELOPMENT

A MATHEMATICAL AND EXPERIMENTAL FOUNDATION FOR STEREOSCOPIC PHOTOGRAPHY. Armin J. Hill. *Journal of the Society of Motion Picture and Television Engineers* 61, No. 4, October, 1953, pages 461-486 (26 pages). The system of stereoscopic photography developed by the Motion Picture Research Council, and now generally used in the major Hollywood studios has been based upon extensive experimental data regarding the processes involved in binocular vision. It is now known that this vision does not give absolute location of points in space, but rather that it is sensitive to small differences in distance and direction. Therefore, it appears logical to use differential rather than integral forms in calculating probable appearances of projected pictures. It is found that this approach removes many of the troublesome restrictions found in suggestions based upon other assumptions. Perspective and apparent depth can be balanced for pictures seen from the better viewing positions in motion picture theaters. It is also possible to include necessary psychological factors to allow satisfactory photography of close-ups and other special effects. The result is that if certain simple limitations and precautions are observed, it is not difficult to obtain stereoscopic motion pictures which are consistently natural in appearance and easy to view.

* FILM COLLOTYPE AN EXPERIMENT FOR LETTERPRESS. *Deutscher Drucker* 51, No. 7, 1953, page 314 (in German). Film collotype, development of collotype attributed to the Italian Speratti, has a celluloid film base. The film is supplied by Agfa already coated. Before printing down, the film is immersed in 5% potassium dichromate. The plate is claimed to have 4-5 times the sensitivity of the ordinary collotype plate. The developed film is frequently mounted with varnish on a metal base, when the block can be included in a type forme if it is borne in mind that temperature and humidity conditions must be similar to those used for collotype. The process is unsuitable for multi-colour printing owing to register difficulties. *Printing Abstracts* 8, No. 10, October, 1953, pages 532-3. Deutscher Drucker is published by Edward Boehme, Lichterfelde West, Berlin, Germany.

TONE AND COLOR

COLOR MATCHING. Emmett E. Flaherty. *Graphic Arts Monthly* 25, No. 9, September, 1953, pages 110, 112 and 114 (3 pages). The foundamental principles in color matching involve limitation of color selection to two primaries to get a clean color and recognition of the importance of transparency. Spectrally true primary colors are commercially unavailable, thus making the first principle difficult to follow.

* DOT COMPARATOR. *U. S. Patent 2,657,611.* Paul F. Borth. *Official Gazette* 676, No. 1, November 3, 1953, page 131. A dot comparator for estimating printed halftone dot areas comprising: a frame having a base, a magnifying glass mounted in said frame so as to be focused near the bottom of said base, and an annual photographic image of a progressively graded series of halftone dots having a size and spacing used on printing plates, said image being imbedded in transparent material mounted in the base so that the center of the image is a sight opening near the focal center of said magnifying glass.

HELPFUL COLOR MEASUREMENTS. Part 1. Frank Preucil. *Graphic Arts Monthly* 25, No. 10, October, 1953, pages 100, 102, 104, 106 and 108 (5 pages). A simple color ink-testing design, and a study of color process ink properties is made. Reflection densitometer readings with red, green, and blue filters are listed and strength, brightness, and mixture potential of the three inks are discussed.

HELPFUL COLOR MEASUREMENTS. Part 2 (Conclusion). Frank Preucil. *Graphic Arts Monthly* 25, 11, November, 1953, pp. 76, 78, 80, 82 and 90 (5 pages). Graphical methods are used to visualize and rate the inks as far as their efficiency as process colors, their hue color, grayness, and color correction factor. Mathematical relationships are given with a complete example worked out in the article.

COLOUR MATCHING AND COLOUR MEASUREMENT. T. Vickerstaff and I. S. M. Walls. *Journal of the Oil and Colour Chemists' Association* 36, 399, September, 1953, pp. 507-523 (17 pages); discussion, 523-530 (8 pages) (total article is 24 pages). The paper is divided into two parts. The first part is a study of the effect of illumination intensity on the ease and accuracy of visual colour matching. It is shown that in the range 14-300 ft. candles, intensity of illumination has no effect upon the acceptance or rejection of near matching patterns. The accuracy of assessment of very small colour differences does however increase with increasing light intensity, but soon reaches a maximum value beyond which further light appears to have no effect. The optimum light intensity under the conditions of these experiments was about 80 ft. candles. In the second half of the paper, attempts have been made to measure small colour differences between patterns in an objective way and to correlate the results with the verbal

descriptions of the colour differences by trained colourists. It is concluded that small colour differences can be measured on a recording spectrophotometer fitted with a continuous integrating device with sufficient accuracy. The results converted into colourists' nomenclature show excellent qualitative agreement with the visual assessments.

COLOR MATCHING. Lithographers Journal 38, No. 12, March, 1954, pages 20-2 (3 pages); *Fuchs and Lang Litho Letter*, January-February, 1953, 4 pages. Color matching, how to do it and the pitfalls that one may run into, are discussed in this article. The three most important factors in color matching are: 1. working in the proper light, 2. accuracy of measurement, and 3. cleanliness. The effects of paper, press, and overprinting are also explained.

PLATES

*METHOD OF MAKING RELIEF PRINTING PLATE MATRICES. *U. S. Patent 2,678,510.* E. W. Fuerst and W. F. Fuerst. *Official Gazette* 682, No. 3, May 18, 1954, page 606. 1. An article for use in the production of relief printing plates, comprising; a master of air-pervious, friable material; a sealing coat on the master, an undercoat of asphalt on the sealing coat, and a layer of light-sensitive material on the undercoat, whereby a relief image may be formed in said master by exposure of the layer to light, washing away unhardened portions thereof and removing the coat, layer and a portion of the master by sandblasting through those parts of the layer where portions thereof have been removed.

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503 Offset Photography (Line)
504 Offset Platemaking (Deep-Etch Gum Process)
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506 Lithographic Offset Press Operating, Vol. II
507 Offset Stripping (Black and White)
508 Offset Photography (Halftone)
509 Offset Photography (Color Separation)
510 Tone and Color Correcting (Dot Etching)
511 Tone and Color Correcting (Hand Retouching)
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653 Lithographic Abstracts—1953
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802 Plate Surface Treatments
803 pH, What it is, How to Measure it, Where to Use it
804 How to Make and Run Deep Etch Plates on Grained Zinc
804S How to Make Deep-Etch Plates on Ungrained Zinc and Aluminum
805 How to Make and Run Better Surface Plates on Zinc
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